# A Cross-National Design to Estimate Effects of COVID-Induced Non-Pharmacological Interventions

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**Insights on COVID-19 Impacts:**
**International Comparisons and Possibilities**
***Population Association of America***
***July 15, 2020***

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# Outline

- Cross-national comparisons as a COVID research design
- Practical considerations – in standard survey samples
  - COVID infections are infrequent
  - COVID deaths are rare
- COVID-induced government mitigation policies
- Measure economic and social effects
- Identification strategies
- Data sources
  - Cross-National Equivalent File
  - COVID-induced policies

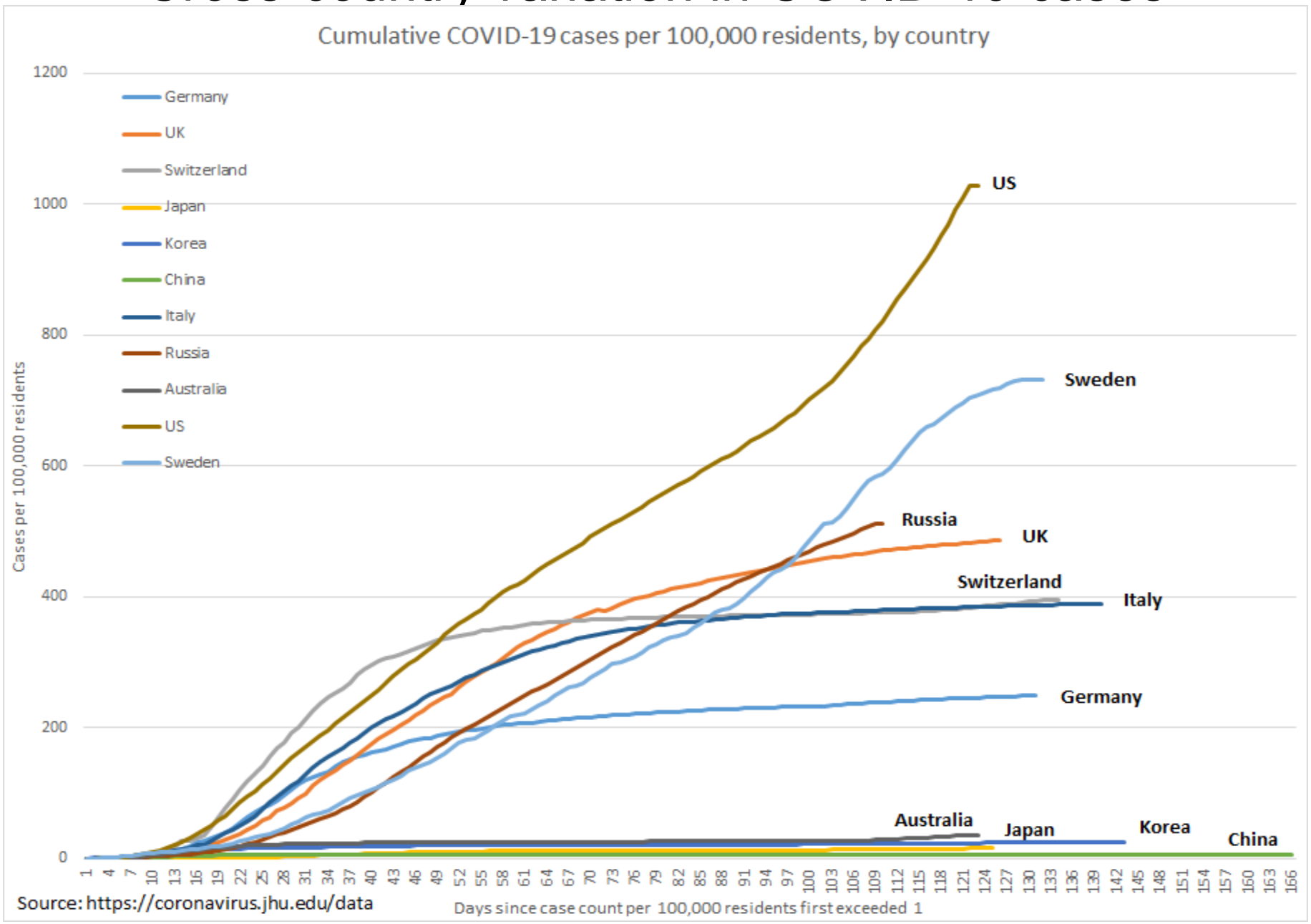
# Why a cross-national comparison?

- Substantial variation (in major determining factors)
  - Health care systems
  - Health care access
  - Living arrangements
  - Population density
  - .....etc
- COVID follows a common underlying biological process (assumed)
- Governments chose different mitigation policies
- Existence of long-running household-based panel surveys – internationally comparable (more below)

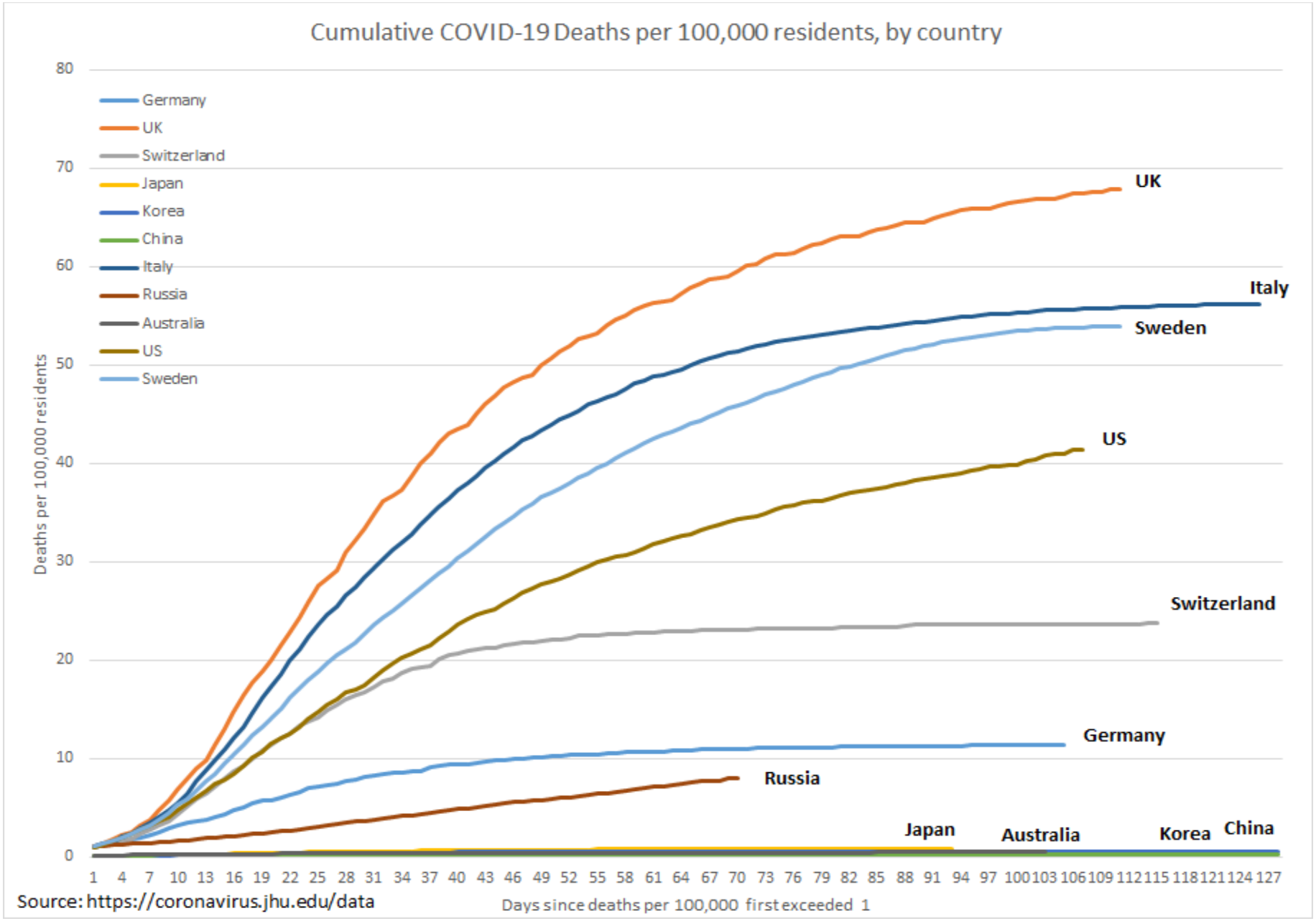
but....

in existing samples, COVID-infection/death data unlikely

# Cross-country variation in COVID-19 cases



# Cross-country variation in COVID-19 deaths



# Infections and deaths per 100,000

| | Infections | | Deaths | |
|---|---|---|---|---|
| Country | Count | per 100,000 | Count | per 100,000 |
| Australia | 9,246 | 37 | 114 | 0.5 |
| China | 83,090 | 6 | 3,328 | 0.2 |
| Germany | 199,950 | 249 | 9,134 | 11.4 |
| Italy | 243,073 | 390 | 35,015 | 56.2 |
| Japan | 20,812 | 17 | 982 | 0.8 |
| Russia | 13,407 | 26 | 290 | 0.6 |
| South Korea | 727,162 | 512 | 11,335 | 8.0 |
| Sweden | 74,910 | 732 | 5,515 | 53.9 |
| Switzerland | 32,880 | 396 | 1,968 | 23.7 |
| UK | 317,868 | 486 | 44,372 | 67.8 |
| US | 3,411,732 | 1028 | 137,201 | 41.3 |

Source: https://coronavirus.jhu.edu/data as of 7/12/2020

# Infections, deaths expected in survey of 10,000 respondents

| | Infections | | Deaths | |
|---|---|---|---|---|
| Country | Count | per 10,000 | Count | per 10,000 |
| Australia | 9,246 | 3.7 | 114 | 0.05 |
| China | 83,090 | 0.6 | 3,328 | 0.02 |
| Germany | 199,950 | 24.9 | 9,134 | 1.14 |
| Italy | 243,073 | 39.0 | 35,015 | 5.62 |
| Japan | 20,812 | 1.7 | 982 | 0.08 |
| Russia | 13,407 | 2.6 | 290 | 0.06 |
| South Korea | 727,162 | 51.2 | 11,335 | 0.80 |
| Sweden | 74,910 | 73.2 | 5,515 | 5.39 |
| Switzerland | 32,880 | 39.6 | 1,968 | 2.37 |
| UK | 317,868 | 48.6 | 44,372 | 6.78 |
| US | 3,411,732 | 102.8 | 137,201 | 4.13 |

Source: https://coronavirus.jhu.edu/data as of 7/12/2020

# Infections and deaths are rare

| | Infections | | | Deaths | | |
|---|---|---|---|---|---|---|
| Country | Count | per 10,000 | Overall risk | Count | per 10,000 | Overall risk |
| Australia | 9,246 | 3.7 | 0.0004 | 114 | 0.05 | 0.000005 |
| China | 83,090 | 0.6 | 0.0001 | 3,328 | 0.02 | 0.000002 |
| Germany | 199,950 | 24.9 | 0.0025 | 9,134 | 1.14 | 0.000114 |
| Italy | 243,073 | 39.0 | 0.0039 | 35,015 | 5.62 | 0.000562 |
| Japan | 20,812 | 1.7 | 0.0002 | 982 | 0.08 | 0.000008 |
| Russia | 13,407 | 2.6 | 0.0003 | 290 | 0.06 | 0.000006 |
| South Korea | 727,162 | 51.2 | 0.0051 | 11,335 | 0.80 | 0.000080 |
| Sweden | 74,910 | 73.2 | 0.0073 | 5,515 | 5.39 | 0.000539 |
| Switzerland | 32,880 | 39.6 | 0.0040 | 1,968 | 2.37 | 0.000237 |
| UK | 317,868 | 48.6 | 0.0049 | 44,372 | 6.78 | 0.000678 |
| US | 3,411,732 | 102.8 | 0.0103 | 137,201 | 4.13 | 0.000413 |

Source: https://coronavirus.jhu.edu/data as of 7/12/2020

# In most common survey data

COVID infections/deaths too rare

- Sample sizes of affected individuals small
- Insufficient power

However, ...can study effects of

COVID-induced government mitigation policies

(social distancing, school/business closures, etc)

Use individual panel data from 11 countries

# Mitigation policies as macro shock

$$Y_{ict} = \beta_0 + \delta \sum_{k=0}^{t} Policy_{c(t-k)} + \beta_1 X_{ict} + \beta_2 \omega_c + \beta_3 \tau_t + \epsilon_{ict}$$

for person i, in country c, at time t

-Use policy history to study how it affected:

- **<u>Economic outcomes</u>**
  - employment, furloughs
  - income, earnings
  - education
- **<u>Social outcomes</u>**
  - partner formation, dating, marital disruptions
  - household composition
  - domestic violence/child abuse
  - fertility

# Cross-National Equivalent File (CNEF)

**Harmonized version of household-based panel surveys**

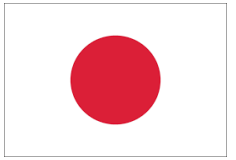
**-Collecting/plan to collect COVID-related content**

**-Plan to merge COVID-induced government mitigation policies**

**(FULL DISCLOSURE: NIH application submitted and under review)**

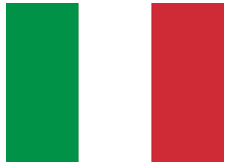
**Current CNEF members (C-10) as of 2020**

| | | | |
|---|---|---|---|
| USA | PSID | – | Panel Study of Income Dynamics (1970-2015) |
| Germany | SOEP | – | German Socio-Economic Panel Study (1984-2018) |
| Great Britain | BHPS | – | British Household Panel Survey (1991-2008, 2009-2016) |
| | UKHLS | – | Understanding Society (2009-2016) |
| Canada | SLID | – | Survey of Labour and Income Dynamics (1992-2009) |
| Australia | HILDA | – | Household, Income & Labour Dynamics in Australia (2001-2018) |
| Switzerland | SHP | – | Swiss Household Panel (1999-2018) |
| Korea | KLIPS | – | Korea Labor and Income Panel Survey (1998-2016) |
| Russia | RLMS-HSE | – | Russia Longitudinal Monitoring Survey (1995-2016) |
| Japan | JHPS | – | Japan Household Panel Study (2009-2014) |



**Coming 2020/2021**

| | | | |
|---|---|---|---|
| Italy | ITA.LI | – | Italian Lives Study (2019) |



**Proposed/planned* (if funded/approved)**

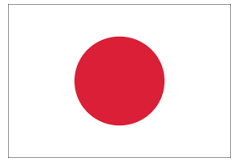
| | | | |
|---|---|---|---|
| China | CFPS | – | China Family Panel Studies (2010-2020) |
| Sweden | ISAD | – | Integrated Swedish Administrative Data |

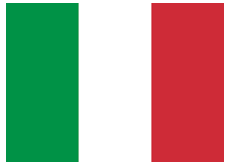
# Cross-National Equivalent File (CNEF)









- Standardized / Harmonized Measures: Income, Demographics, Employment, Health, Satisfaction
  - common variable names
  - common concept
  - common response categories
- Worldwide availability for scientific research
- Supporting link to underlying national microdata

# Planned/actual COVID-related content CNEF Partners

| Household panel characteristics and COVID-related content | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Study acronym** | HILDA | CFPS | SOEP | JHPS | KLIPS | ITA.LI | RLMS-HSE | SHP | UKHLS | PSID |
| **Start year** | 2001 | 2010 | 1984 | 2004 | 1998 | 2019 | 1994 | 1999 | 2009 | 1968 |
| **Recent wave (expected) end** | 20-Feb | 19-Feb | 20-Aug | 20-Apr | 19-Dec | 20-May | 20-Feb | 20-Mar | 22-May | 19-Dec |
| **Interviews (individuals)** | 17,462 | ~30,000 | 49,921 | ~6,000 | 23,000 | ~10,000 | 15,000 | 8,900 | ~40,000 | 26,395 |
| **Interviews (households)** | 9,665 | ~12,000 | 18,682[d] | ~4,000 | 11,700 | ~5,000 | 7,000 | 5,700 | 22,400 | 9,614 |
| **COVID survey-mode[a]** | 5, 6 | 4, 5 | 5 | 2, 6 | 4, 5, 7 | 6 | 3, 4 | 3, 6 | 6 | 4-6 |
| **Survey duration (mins)** | 8 | Core | 20-25 | 20-25 | 10-15 | 15-20 | tbd | 15 | 15-20 | Core |
| **Number of questions** | 108 | ~20 | 69 | 55 | ~40 | ~40 | tbd | 65 | ~150 | tbd |

**Notes:tbd = "to be determined"**
**[a]Survey mode coding: 1) In person; 2) Mail; 3) PAPI; 4) CAPI; 5) CATI; 6) Web/CAWI; 7) Self-completion questionnaire**
**[b]UKHLS: Two waves in field simultaneously. COVID questions being asked on main interview and special new monthly survey. Information here and content information below refers to the special monthly COVID supplemental survey. End date is still to be determined.**
**[c]HILDA: Collected in other years.**
**[d]SOEP figures for 2018 sample. SOEP expects about 10,000 household responses to the COVID supplemental survey.**

# COVID-related content - cont.

| COVID Topical modules | HILDA | CFPS | SOEP | JHPS | KLIPS | ITA.LI | RLMS | SHP | UKHLS | PSID |
|---|---|---|---|---|---|---|---|---|---|---|
| Household corona prevalence | no | yes | yes | no | no | yes | yes | yes | yes | tbd |
| Individual risk perception | no[c] | yes | yes | yes | yes | yes | yes | no | tbd | tbd |
| Expected corona risk | yes | no | yes | yes | yes | yes | yes | yes | tbd | tbd |
| Health behavior | yes | yes | yes | yes | yes | yes | yes | yes | yes | Core |
| Employment status/changes | yes | yes | yes | yes | yes | yes | yes | yes | yes | Core |
| Self-employment module | minimal | yes | yes | yes | yes | partly | yes | yes | yes | Core |
| Current child care | yes | Core | yes | yes | yes | yes | yes | yes | tbd | Core |
| Perceived child care burden | no[c] | no | yes | yes | yes | yes | yes | yes | tbd | tbd |
| Schooling | yes | yes | yes | yes | yes | yes | yes | yes | yes | tbd |
| Current time use | yes | yes | yes | yes | yes | no | yes | yes | tbd | Core |
| Current satisfaction (domains) | yes (8) | yes (6) | yes (6) | yes (6) | yes (6) | yes (6) | yes (6) | yes (6) | tbd | tbd |
| Satisfaction w/covid mngmnt | no | no | yes | yes | yes | no | yes | yes | tbd | tbd |
| Caring (self/others) | yes | no | yes | yes | yes | yes | yes | yes | yes | tbd |
| Affective well-being | no | Core | yes | yes | yes | yes | yes | yes | yes | Core |
| Resilience | maybe | no | yes | yes | yes | yes | yes | yes | yes | tbd |
| Social cohesion | no | no | yes | yes | no | no | yes | yes | tbd | tbd |
| Anxiety/worry/fear | no | Core | yes | yes | yes | partly | yes | yes | yes | Core |
| Generalized trust | no[c] | Core | yes | yes | no | no | yes | yes | tbd | tbd |
| Current life satisfaction | yes | Core | yes | yes | yes | yes | yes | yes | yes | Core |

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# Current availability:

**available: UKHLS; in field: SOEP, ITA.LI, KLIPS, SHP**

| COVID Topical modules | HILDA | CFPS | SOEP | JHPS | KLIPS | ITA.LI | RLMS | SHP | UKHLS | PSID |
|---|---|---|---|---|---|---|---|---|---|---|
| Household corona prevalence | no | yes | yes | no | no | yes | yes | yes | yes | tbd |
| Individual risk perception | no[c] | yes | yes | yes | yes | yes | yes | no | tbd | tbd |
| Expected corona risk | yes | no | yes | yes | yes | yes | yes | yes | tbd | tbd |
| Health behavior | yes | yes | yes | yes | yes | yes | yes | yes | yes | Core |
| Employment status/changes | yes | yes | yes | yes | yes | yes | yes | yes | yes | Core |
| Self-employment module | minimal | yes | yes | yes | yes | partly | yes | yes | yes | Core |
| Current child care | yes | Core | yes | yes | yes | yes | yes | yes | tbd | Core |
| Perceived child care burden | no[c] | no | yes | yes | yes | yes | yes | yes | tbd | tbd |
| Schooling | yes | yes | yes | yes | yes | yes | yes | yes | yes | tbd |
| Current time use | yes | yes | yes | yes | yes | no | yes | yes | tbd | Core |
| Current satisfaction (domains) | yes (8) | yes (6) | yes (6) | yes (6) | yes (6) | yes (6) | yes (6) | yes (6) | tbd | tbd |
| Satisfaction w/covid mngmnt | no | no | yes | yes | yes | no | yes | yes | tbd | tbd |
| Caring (self/others) | yes | no | yes | yes | yes | yes | yes | yes | yes | tbd |
| Affective well-being | no | Core | yes | yes | yes | yes | yes | yes | yes | Core |
| Resilience | maybe | no | yes | yes | yes | yes | yes | yes | yes | tbd |
| Social cohesion | no | no | yes | yes | no | no | yes | yes | tbd | tbd |
| Anxiety/worry/fear | no | Core | yes | yes | yes | partly | yes | yes | yes | Core |
| Generalized trust | no[c] | Core | yes | yes | no | no | yes | yes | tbd | tbd |
| Current life satisfaction | yes | Core | yes | yes | yes | yes | yes | yes | yes | Core |

**Notes: tbd = "to be determined"**

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**[d]SOEP figures for 2018 sample. SOEP expects about 10,000 household responses to the COVID supplemental survey.**

# COVID-related UKHLS data

- Questionnaires available here:

https://www.understandingsociety.ac.uk/documentation/covid-19/questionnaires

- Data access here:
- https://www.understandingsociety.ac.uk/research/themes/covid-19

# Advantages of using COVID-induced policies

- Everyone “treated”
- Timing directly comparable (in principle)
- Potential variation from implementation, strengthening, loosening, and repeal
- Estimate short- and long-run effects (cumulative)
- Differential potential impact,
  - by SES
  - Employment status
  - Occupation
  - Education
  - Age
- Possible to compare across countries
- Linked to panel data can hope to identify causal effects

# Challenges

Getting detailed measures

By jurisdiction within countries

Documenting changes

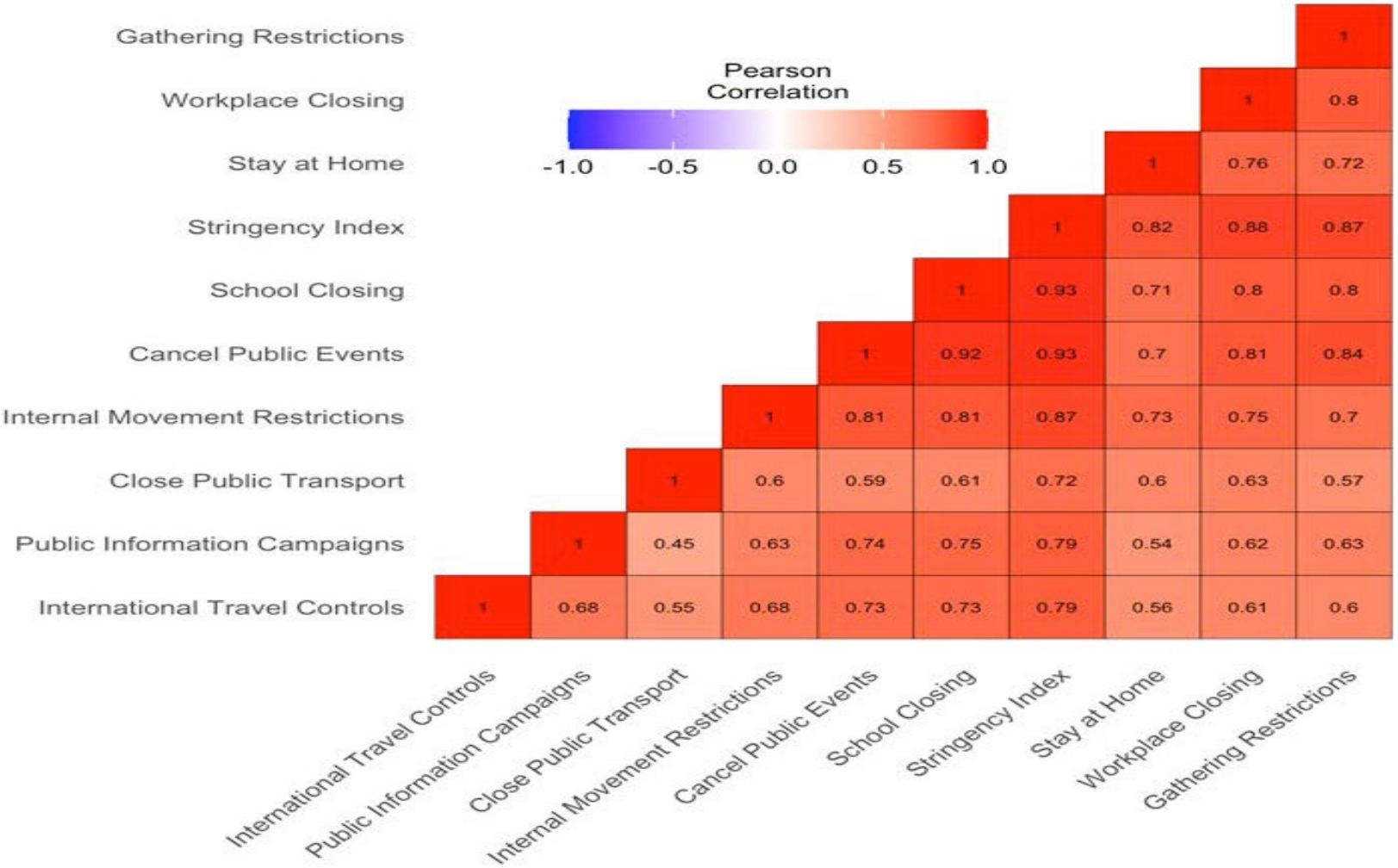
Measuring independent variation

Harmonizing to common metric

Measuring independent variation in policies

# Example: Must harmonize COVID policies

**Code to capture independent variation in COVID-induced mitigation policies**
**Countries set policies simultaneously**




Source: Jinjarak et al. 2020

# Summary

Estimated effects of COVID-induced government mitigation policies needed to

- measure economic and social costs and benefits
- inform possible policies in future

Requires

- individual panel data
- sufficient within/cross-country variation
- Cross-National Equivalent File data natural source
- Planned expansion of CNEF
  - (if funded) will add China and Sweden

Panels are/will soon collect data

If proposed project funded, will add

- COVID survey data
- harmonized government mitigation policies

For further information:

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Columbus, OH 43201
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Fax: 614-688-8133
https://cnef.ehe.osu.edu/

or

Google “CNEF OSU”

Check for CNEF COVID-related news

# Cross-National Equivalent File (CNEF)






Reference articles


- Burkhauser RV, Butrica BA, Daly MC, Lillard DR. 2001. “The Cross-National Equivalent File: A product of cross-national research.” in Irene Becker, I., Ott, N. and Rolf, G. (eds) Soziale Sicherung in einer dynamischen Gesellschaft, Campus Verlag.
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