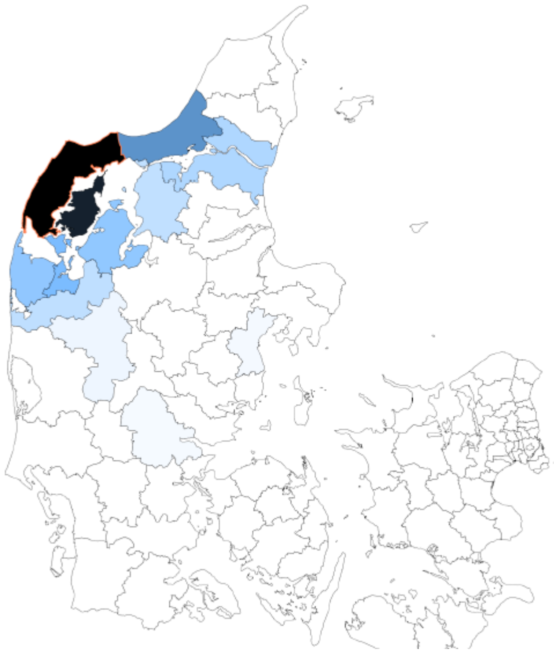
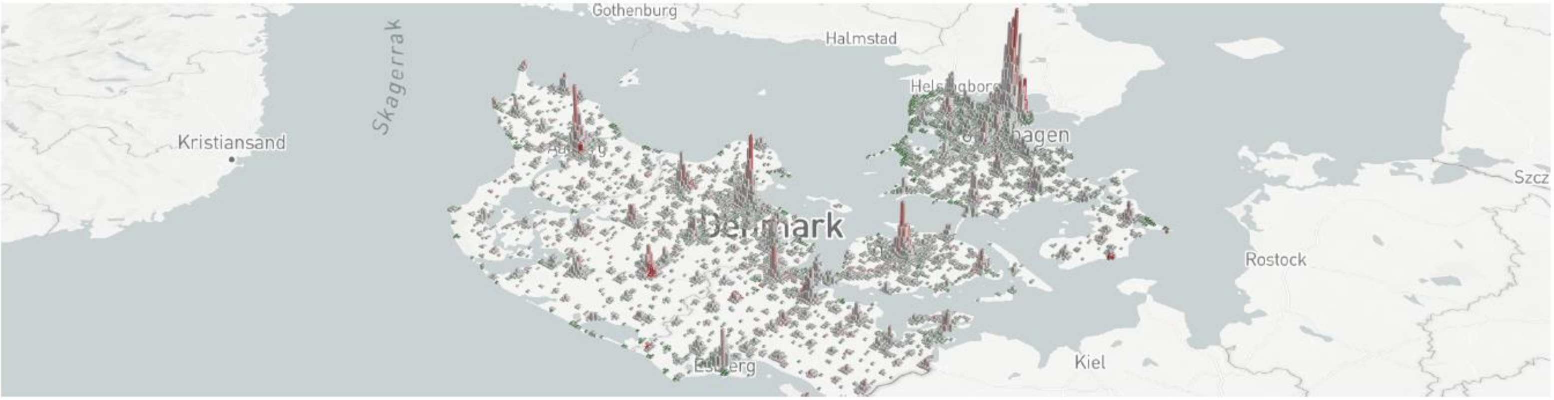
Hvad endte vi med?

- 4 teleselskaber med meget forskellige holdninger til analyse af mobilitets data.
- (Fordi Erhvervsstyrelsen, Justitsministeriet og Datatilsynet skulle ind over kunne vi kun formulere en relativt enkel forespørgsel)
- Hvad gør vi hvis man ikke udregner OD-matricer? (1 time?, 6 timer?, 12?, 24?)
- Hvad gør vi når folk i ministeriet, osv ikke fatter anonymisering?



http://covid19.compute.dtu.dk

Mobility and monitoring - lots of reports



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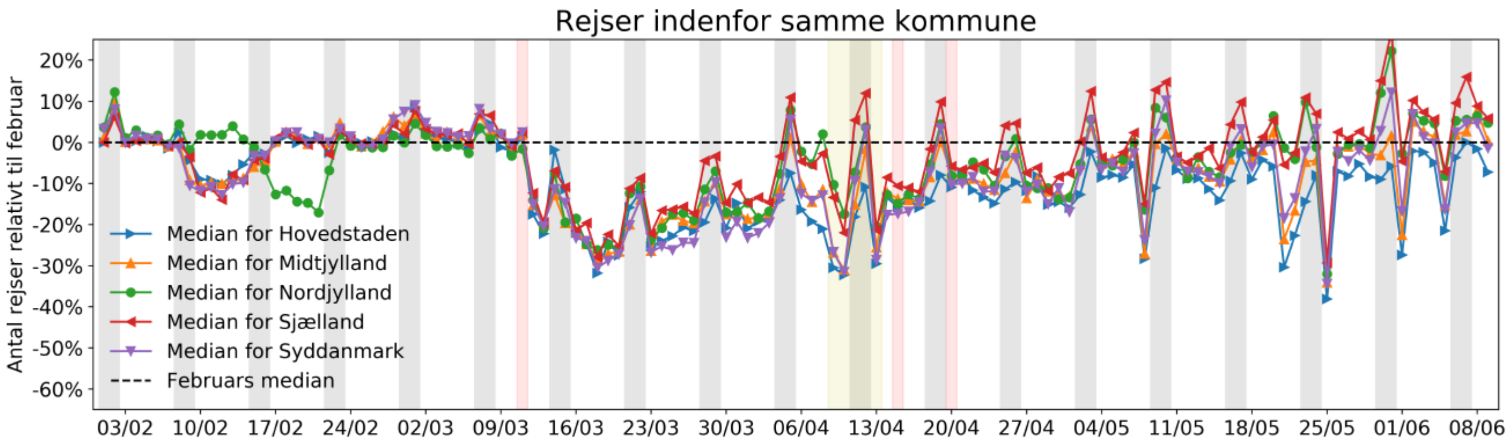
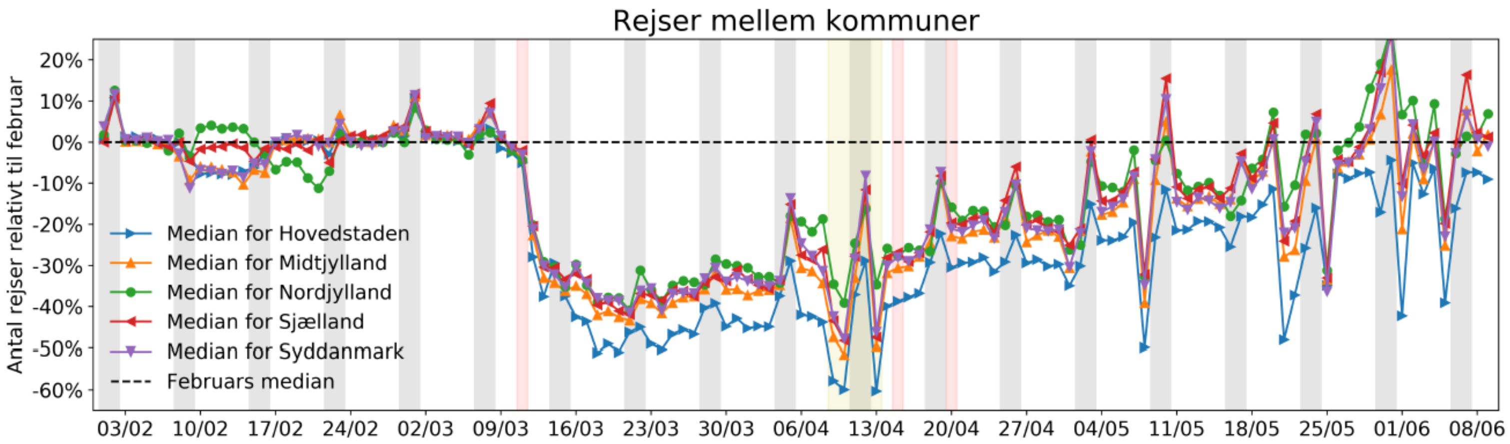

Rejser indenfor samme kommune
Antal rejser relativt til februar
20%
10%
0%
-10%
-20%
-30%
-40%
-50%
-60%
Median for Hovedstaden
Median for Midtjylland
Median for Nordjylland
Median for Sjælland
Median for Syddanmark
Februars median
03/02 10/02 17/02 24/02 02/03 09/03 16/03 23/03 30/03 06/04 13/04 20/04 27/04 04/05 11/05 18/05 25/05 01/06 08/06


Rejser mellem kommuner
Antal rejser relativt til februar
20%
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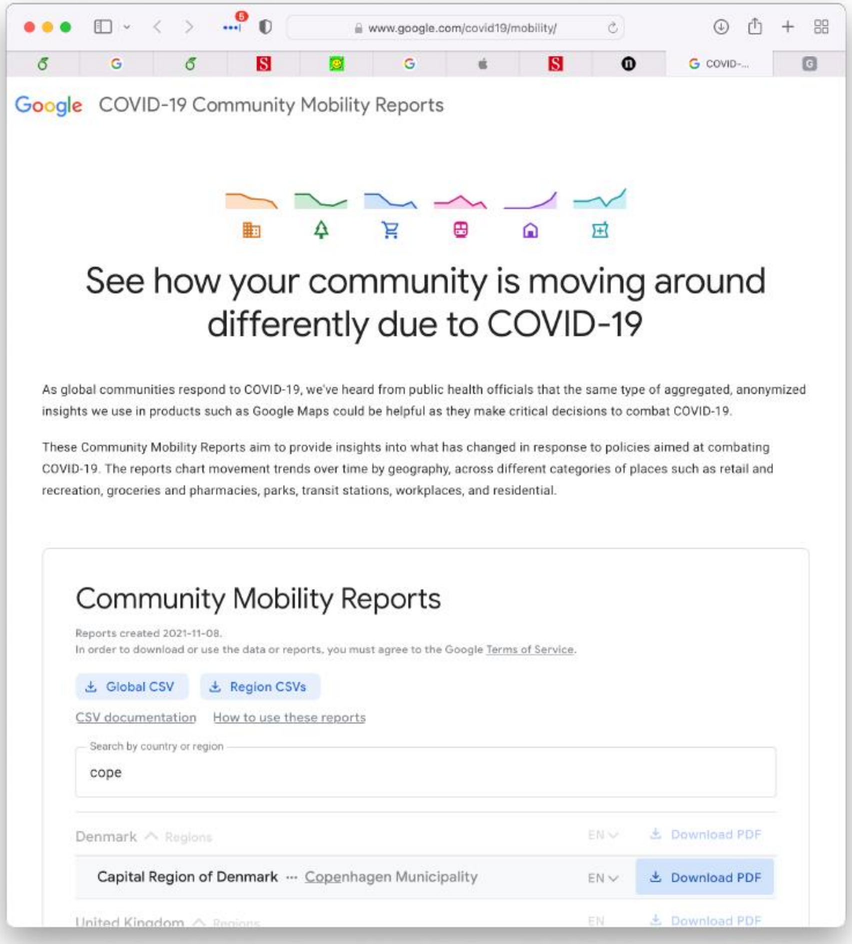
Median for Hovedstaden
Median for Midtjylland
Median for Nordjylland
Median for Sjælland
Median for Syddanmark
Februars median
03/02 10/02 17/02 24/02 02/03 09/03 16/03 23/03 30/03 06/04 13/04 20/04 27/04 04/05 11/05 18/05 25/05 01/06 08/06


www.google.com/covid19/mobility/
Google COVID-19 Community Mobility Reports
See how your community is moving around differently due to COVID-19
As global communities respond to COVID-19, we've heard from public health officials that the same type of aggregated, anonymized insights we use in products such as Google Maps could be helpful as they make critical decisions to combat COVID-19.
These Community Mobility Reports aim to provide insights into what has changed in response to policies aimed at combating COVID-19. The reports chart movement trends over time by geography, across different categories of places such as retail and recreation, groceries and pharmacies, parks, transit stations, workplaces, and residential.
Community Mobility Reports
Reports created 2021-11-08.
In order to download or use the data or reports, you must agree to the Google Terms of Service.
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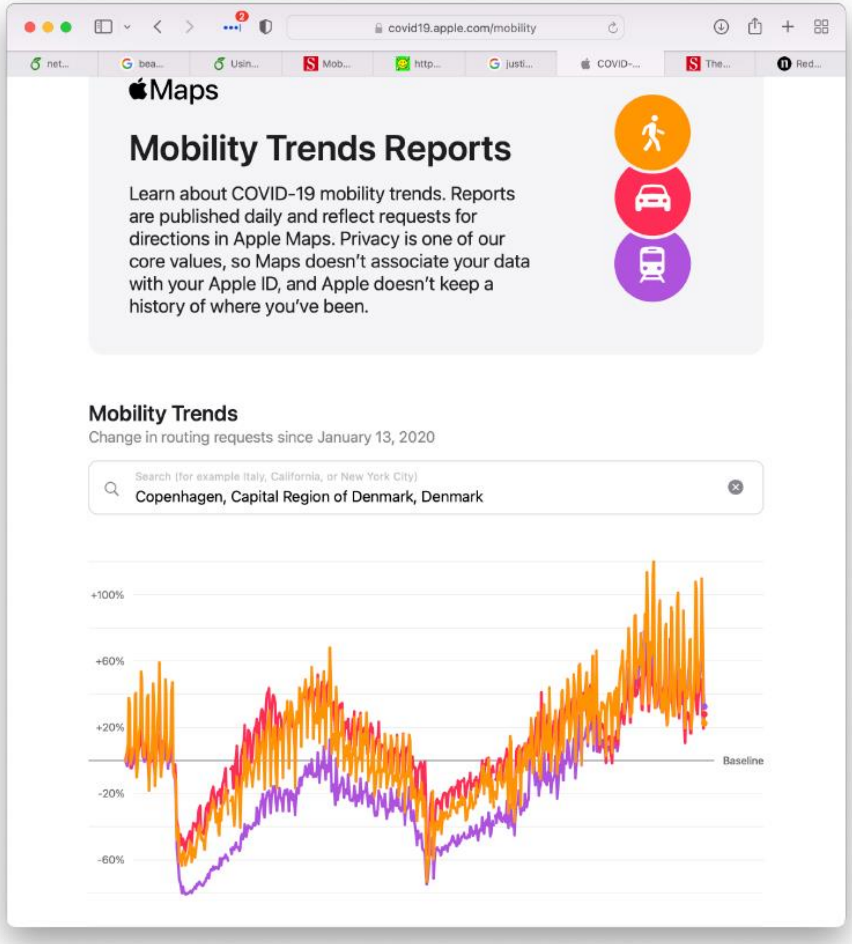

covid19.apple.com/mobility
Maps
Mobility Trends Reports
Learn about COVID-19 mobility trends. Reports are published daily and reflect requests for directions in Apple Maps. Privacy is one of our core values, so Maps doesn't associate your data with your Apple ID, and Apple doesn't keep a history of where you've been.
Mobility Trends
Change in routing requests since January 13, 2020
Search (for example Italy, California, or New York City)
Copenhagen, Capital Region of Denmark, Denmark
+100%
+60%
+20%
Baseline
-20%
-60%

Article | Open Access | Published: 17 February 2021

Reduction in mobility and COVID-19 transmission

Pierre Nouvellet, Sangeeta Bhatia, [...] Christl A. Donnelly

Nature Communications **12**, Article number: 1090 (2021) | Cite this article

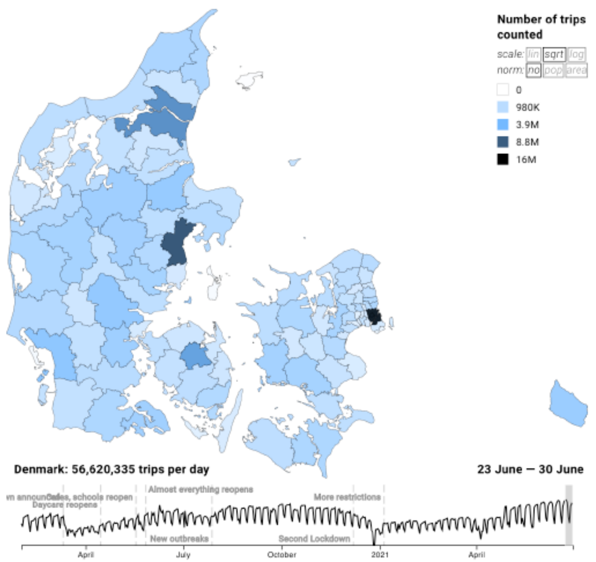
Abstract

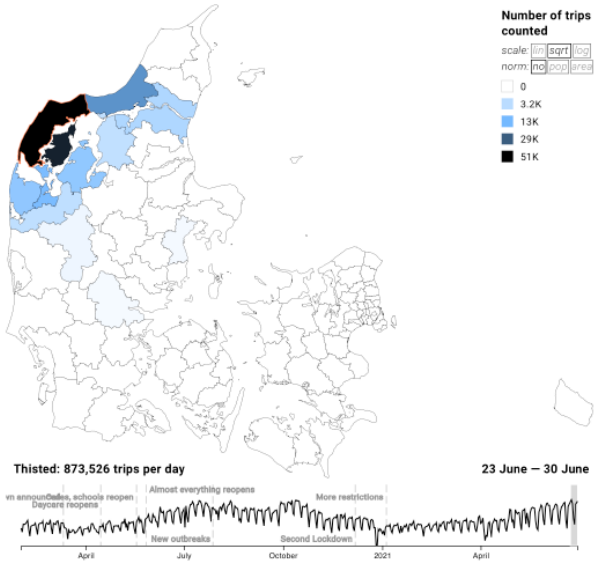
In response to the COVID-19 pandemic, countries have sought to control SARS-CoV-2 transmission by restricting population movement through social distancing interventions, thus reducing the number of contacts. Mobility data represent an important proxy measure of social distancing, and here, we characterise the relationship between transmission and mobility for 52 countries around the world. Transmission significantly decreased with the initial reduction in mobility in 73% of the countries analysed, but we found evidence of decoupling of transmission and mobility following the relaxation of strict control measures for 80% of countries. For the majority of countries, mobility explained a substantial proportion of the variation in transmissibility (median adjusted R-squared: 48%, interquartile range - IQR - across countries [27–77%]). Where a change in the relationship occurred, predictive ability decreased after the relaxation; from a median adjusted R-squared of 74% (IQR across countries [49–91%]) pre-relaxation, to a median adjusted R-squared of 30% (IQR across countries [12–48%]) post-relaxation. In countries with a clear relationship between mobility and transmission both before and after strict control measures were relaxed, mobility was associated with lower transmission rates after control measures were relaxed indicating that the beneficial effects of ongoing social distancing behaviours were substantial.

Korrelationen der forsvandt!

~~Mobilitet som mål for mængden af smitte~~

Mobilitet som mål for geografisk spredning





http://covid19.compute.dtu.dk/visualizations/telco_brush/

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Article submitted to journal

Subject Areas:
Complexity, Network Science

Keywords:
Human Mobility, COVID-19, Non-negative Matrix Factorization

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Understanding components of mobility during the COVID-19 pandemic

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[1]Department of Applied Mathematics and Computer Science, Technical University of Denmark, Kongens Lyngby, Denmark
[2]The Center for Social Data Science, University of Copenhagen, Copenhagen, Denmark
[3]Statistics Denmark, Copenhagen, Denmark

Travel restrictions have proven to be an effective strategy to control the spread of the COVID-19 epidemics, in part because they help delay disease propagation across territories. The question, however, as to how different types of travel behaviour, from commuting to holiday-related travel, contribute to the spread of infectious diseases remains open. Here, we address this issue by using factorization

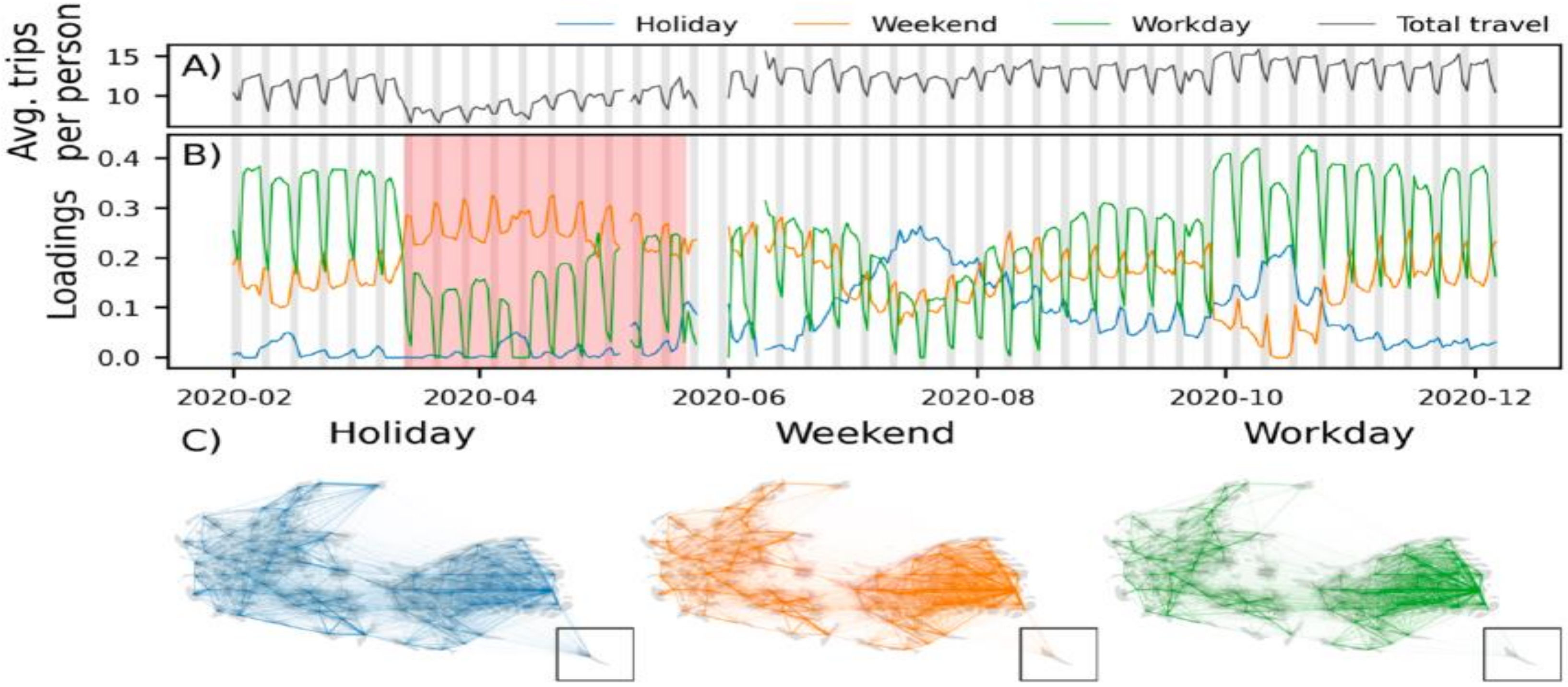
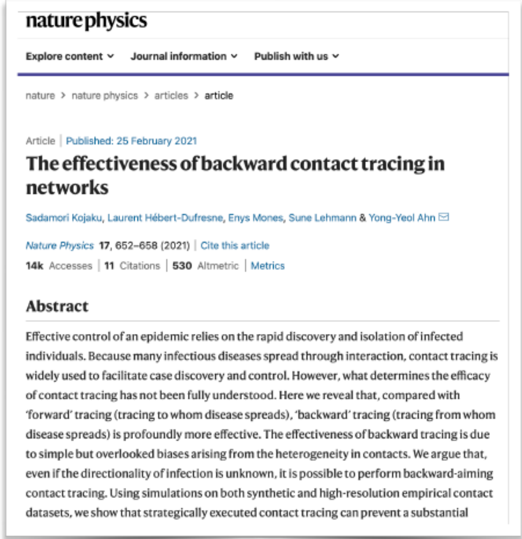


Figure 1: **Mobility patterns in Denmark can be decomposed into three interpretable components.** (A) Estimated number of trips per person over time. (B) The loadings $\mathbf{H}_k$ of the three components of mobility identified by NMF over time: the *holiday* component (blue, for $k = 1$), the *weekend* component (orange, for $k = 2$) and the *workday* component (green, for $k = 3$). The red area indicates the period of 'lockdown' (see Supplementary Information Figure S6). (C) The memberships $\mathbf{W}_k^\intercal$ of links representing the number of trips between cities to the three components *holiday*, *weekend* and *workday* (from left to right). Links are represented on cartograms [28] displaying the map of Denmark (see Material and Methods). For visualization purposes, the link widths are proportional to the $x^{1.5}$, where x is the membership to the component.

Contact tracing



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Article | Published: 25 February 2021

The effectiveness of backward contact tracing in networks

Sadamori Kojaku, Laurent Hébert-Dufresne, Enys Mones, Sune Lehmann & Yong-Yeol Ahn

Nature Physics 17, 652–658 (2021) | Cite this article

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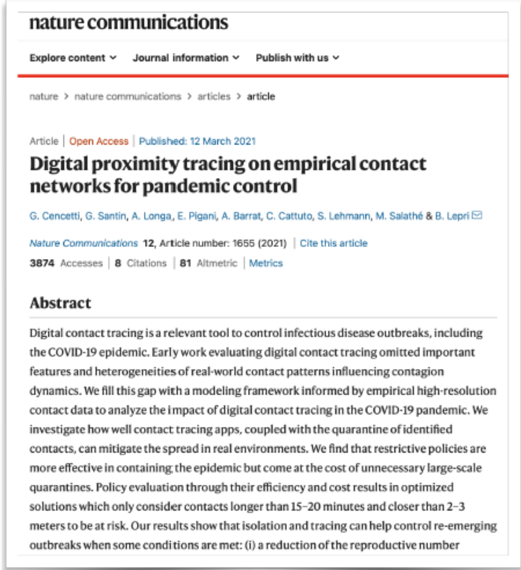
Abstract

Effective control of an epidemic relies on the rapid discovery and isolation of infected individuals. Because many infectious diseases spread through interaction, contact tracing is widely used to facilitate case discovery and control. However, what determines the efficacy of contact tracing has not been fully understood. Here we reveal that, compared with 'forward' tracing (tracing to whom disease spreads), 'backward' tracing (tracing from whom disease spreads) is profoundly more effective. The effectiveness of backward tracing is due to simple but overlooked biases arising from the heterogeneity in contacts. We argue that, even if the directionality of infection is unknown, it is possible to perform backward-aiming contact tracing. Using simulations on both synthetic and high-resolution empirical contact datasets, we show that strategically executed contact tracing can prevent a substantial



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Article | Open Access | Published: 12 March 2021

Digital proximity tracing on empirical contact networks for pandemic control

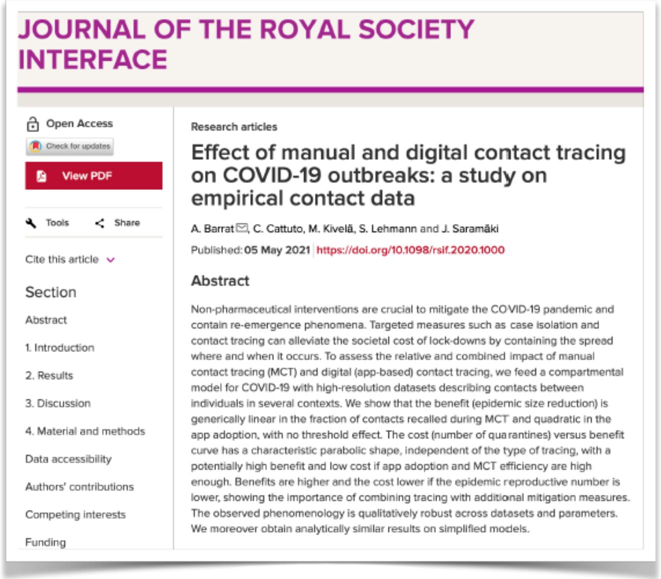
G. Cencetti, G. Santin, A. Longa, E. Pigani, A. Barrat, C. Cattuto, S. Lehmann, M. Salathé & B. Lepri

Nature Communications 12, Article number: 1655 (2021) | Cite this article

3874 Accesses | 8 Citations | 81 Altmetric | Metrics

Abstract

Digital contact tracing is a relevant tool to control infectious disease outbreaks, including the COVID-19 epidemic. Early work evaluating digital contact tracing omitted important features and heterogeneities of real-world contact patterns influencing contagion dynamics. We fill this gap with a modeling framework informed by empirical high-resolution contact data to analyze the impact of digital contact tracing in the COVID-19 pandemic. We investigate how well contact tracing apps, coupled with the quarantine of identified contacts, can mitigate the spread in real environments. We find that restrictive policies are more effective in containing the epidemic but come at the cost of unnecessary large-scale quarantines. Policy evaluation through their efficiency and cost results in optimized solutions which only consider contacts longer than 15–20 minutes and closer than 2–3 meters to be at risk. Our results show that isolation and tracing can help control re-emerging outbreaks when some conditions are met: (i) a reduction of the reproductive number



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Section

Abstract

1. Introduction

2. Results

3. Discussion

4. Material and methods

Data accessibility

Authors' contributions

Competing interests

Funding

Research articles

Effect of manual and digital contact tracing on COVID-19 outbreaks: a study on empirical contact data

A. Barrat, C. Cattuto, M. Kivelä, S. Lehmann and J. Saramäki

Published: 05 May 2021 https://doi.org/10.1098/rsif.2020.1000

Abstract

Non-pharmaceutical interventions are crucial to mitigate the COVID-19 pandemic and contain re-emergence phenomena. Targeted measures such as case isolation and contact tracing can alleviate the societal cost of lock-downs by containing the spread where and when it occurs. To assess the relative and combined impact of manual contact tracing (MCT) and digital (app-based) contact tracing, we feed a compartmental model for COVID-19 with high-resolution datasets describing contacts between individuals in several contexts. We show that the benefit (epidemic size reduction) is generically linear in the fraction of contacts recalled during MCT and quadratic in the app adoption, with no threshold effect. The cost (number of quarantines) versus benefit curve has a characteristic parabolic shape, independent of the type of tracing, with a potentially high benefit and low cost if app adoption and MCT efficiency are high enough. Benefits are higher and the cost lower if the epidemic reproductive number is lower, showing the importance of combining tracing with additional mitigation measures. The observed phenomenology is qualitatively robust across datasets and parameters. We moreover obtain analytically similar results on simplified models.