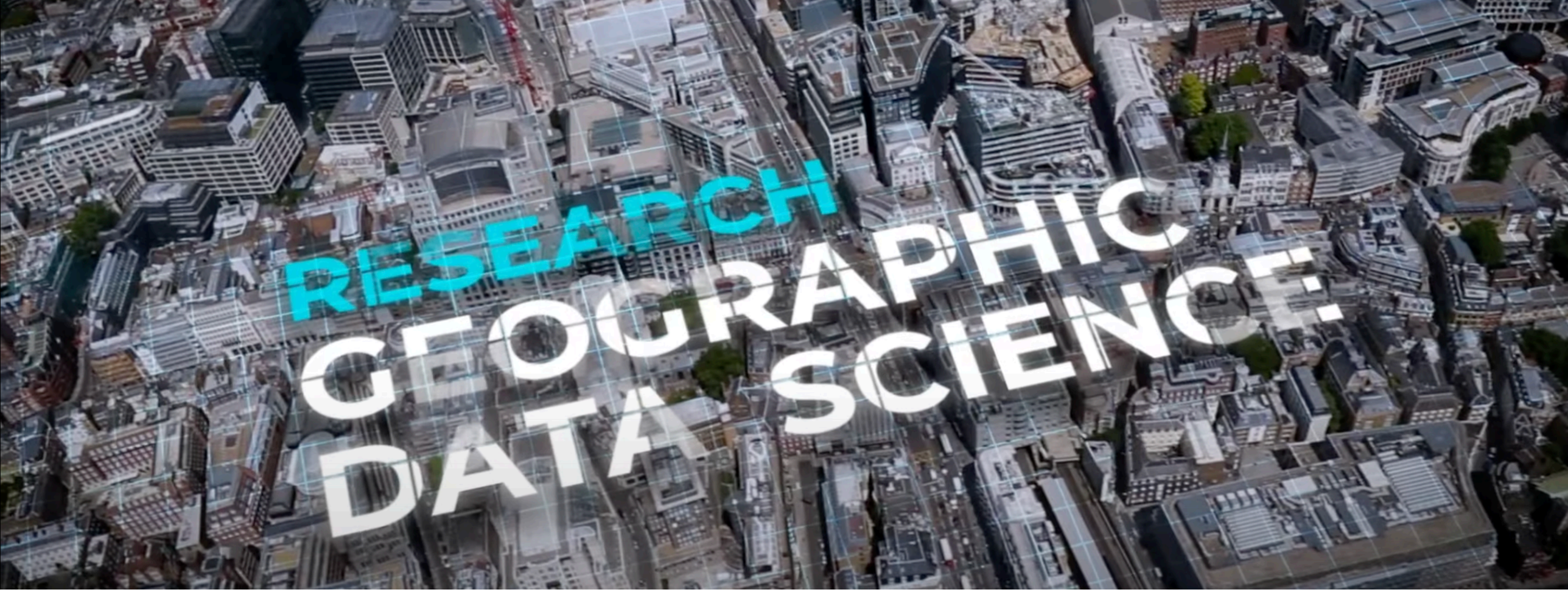

Policy Discussion Workshop: Using Digital Footprint Data to Understand Mobility

UNIVERSITY OF LIVERPOOL

NACIONES UNIDAS CEPAL 75 años Trabajando por un futuro productivo, inclusivo y sostenible

UKRI Research England

Geographic Data Science Lab

Geographic Data Science Lab

GDSL

45 People

- 13 Staff / 7 ECAs
- 6 Postdoctoral fellows
- 26 PhD students

Multidisciplinary team

Core Research Areas

Integration of data science & geography

Pioneering new Geographic Data Science methodologies and applications

Understanding the morphology of cities

Geographies of resilience, exclusion and opportunity

Explaining urban, regional and population dynamics

Geographic Data Science MSc

Programme duration: **Full-time: 12 months**

Programme start: **September 2022**

Entry requirements: **You will need a 2:1 Honours degree or better in an appropriate field of study. Individual consideration is given to mature students with significant and relevant experience and with professional qualifications.**

Scholarships available

Apply

Meet us

Overview | Module details | Entry requirements | Fees | Applying | Career prospects | About us

Consumer Data Research Centre

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Consumer data and research providing insight into societal and economic challenges

Agenda

Time	Activity
14:30–14:45	Welcome
14:45–15:05	Introductions
15:05–15:20	Workshop aims
15:20–15:50	Presentation of preliminary findings
15:50–16:05	Coffee break
16:05–16:50	Policy implications discussion
16:50–17:50	Future collaboration discussion
17:50–18:00	Wrap-up

Introductions

RECAST Team

Carmen Cabrera-Arnau

Ruth Neville

Francisco Rowe

Andrea Nasuto

Miguel González-Leonardo

Workshop Aims

Aim

- To discuss preliminary results of our research on post-COVID-19 human mobility;
- To identify potential policy recommendations in the context of pandemic recovery and resilience & data policy agendas;
- To explore areas of future collaboration.

Today

Presentation

Feedback & Policy implications discussion

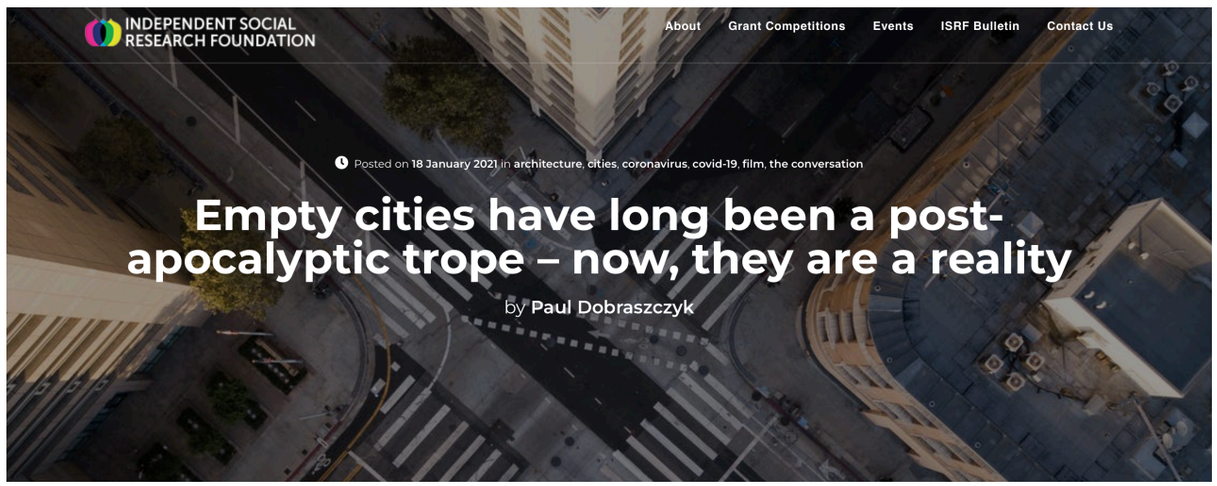
Future collaboration

Spatial Patterns of Human Mobility Post-COVID-19

The Big Read Coronavirus economic impact + Add to myFT

From peak city to ghost town: the urban centres hit hardest by Covid-19

FT research shows London and New York have suffered the most from the pandemic, but more substantial change lies ahead



The New York Times

c › | LIVE Covid-19 Updates | Map and Cases | How Novavax Vaccine Works | What to Know About BA.5

There's an Exodus From the 'Star Cities,' and I Have Good News and

The Pandemic Emptied Europe's Cities. What Will Bring People Back?

City life came to a standstill from London to Berlin when the coronavirus struck. Now worries of a lasting exodus are pushing urban authorities to address long-festering problems.

Chile

Una carretera casi vacía durante una orden de cuarentena total en Santiago de Chile el fin de semana pasado. Cristóbal Olivares para The New York Times

Argentina

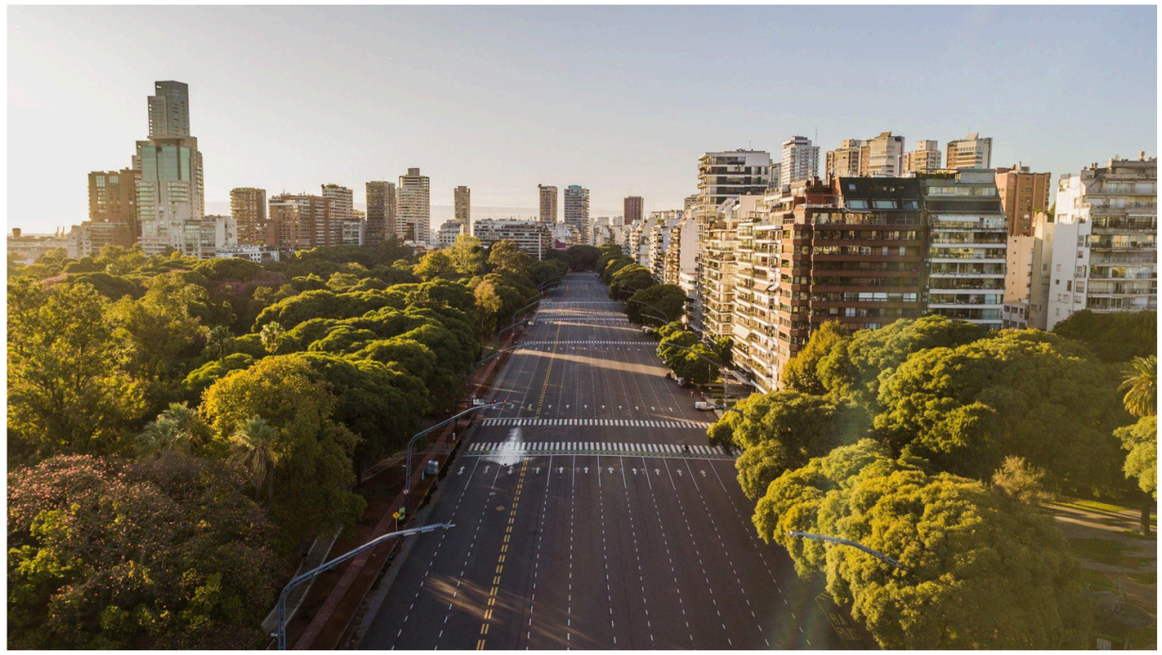


Fig. 1. Avenida del Libertador (Buenos Aires) vacía en cuarentena. Autor: Cami Radri.

Colombia

Fig. 2. Cuerpos que se evitan en las calles de Córdoba. Fuente: Fotografías La Tinta.

Mexico

Empty Plaza del Zócalo in Mexico City during lockdown. Photo: Hector Vivas / Getty Images

Received: 24 February 2022 | Revised: 1 May 2022 | Accepted: 3 May 2022

DOI: 10.1002/psp.2578

RESEARCH ARTICLE

WILEY

Understanding patterns of internal migration during the COVID-19 pandemic in Spain

Miguel González-Leonardo[1] | Antonio López-Gay[2,3] | Niall Newsham[4] | Joaquín Recaño[2,3] | Francisco Rowe[4]

[1]International Institute for Applied Systems Analysis, Wittgenstein Centre for Demography and Global Human Capital, Vienna, Austria

[2]Department of Geography, Universitat Autònoma de Barcelona, Barcelona, Spain

[3]Centre d'Estudis Demogràfics, Barcelona, Spain

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Funding information
Ministerio de Ciencia e Innovación, Grant/Award Number: PID2020-113665RB-I00; Universitat Autònoma de Barcelona: TalentProgram; "la Caixa" Foundation, Grant/Award Number: LCF/PR/SR21/52560007; Alan Turing Institute, Grant/Award Number: 1162533

Abstract

Existing empirical work has analysed the impacts of COVID-19 on mortality, fertility and international migration. Less is known about the ways in which the COVID-19 pandemic has influenced the patterns of internal migration. Anecdotal reports of m
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Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud

Rural revival? The rise in internal migration to rural areas during the COVID-19 pandemic. Who moved and Where?

Miguel González-Leonardo [a,*,1], Francisco Rowe [b,2,**], Alberto Fresolone-Caparrós [a,1]

[a] International Institute for Applied Systems Analysis, Wittgenstein Centre, Austria
[b] Geographic Data Science Lab, Department of Geography and Planning, University of Liverpool, Liverpool, United Kingdom

ARTICLE INFO

ABSTRACT

ıg the outbreak of the COVID-19 pandemic, anecdotal evidence of a "rural revival" eme
ın exodus" hypothesis. Currently, we know that internal migration to rural areas increasec
ıg 2020, although not with the intensity speculated by the media. However, little is kn
tes of rural areas attracting migrants, demographic composition of migration inflow
ıisation movements persisted over 2021. Drawing on administrative population register
ıain types of rural areas pulling internal migrants in Spain and their demographic char
ɜex and place of birth during 2020 and 2021, using the period 2016–2019 as a benchmarl
ın-migration increased in rural areas close to cities and with high prevalence of second h
out-migration declined. Exceptionally high inflows persisted over 2021, but outflows cc
ved prior to the pandemic. Inflows to rural areas comprised internal migrants across a v

REGIONAL STUDIES, REGIONAL SCIENCE
2022, VOL. 9, NO. 1, 600–602
https://doi.org/10.1080/21681376.2022.2125824

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REGIONAL GRAPHIC

OPEN ACCESS Check for updates

Visualizing internal and international migration in the Spanish provinces during the COVID-19 pandemic

Miguel González-Leonardo [a] and Francisco Rowe [b]

ABSTRACT

Drawing on register records from 2019 to 2021, we analyse the impact of COVID-19 on internal and international migration across the 50 Spanish provinces (NUTS-3 regions). Our results show that net-international migration declined in all the provinces during the pandemic, particularly in high-

Population, Space and Place

EDITORIAL | Full Access

Virtual special issue: Internal migration in times of COVID-19

Francisco Rowe, Miguel González-Leonardo, Tony Champion

First published: 14 March 2023 | https://doi.org/10.1002/psp.2652

SECTIONS PDF

Abstract

The COVID-19 pandemic has potentially altered the system of pop
around the world. As COVID-19 hit cities the hardest in the wake
apocalyptic headlines anticipated the 'death of cities'. Yet, little wa
impact of the COVID-19 pandemic on cities and the ways it has sh
internal population movement in and out of cities. This virtual spe
consolidate our knowledge of the impacts of the COVID-19 pande
migration, discuss key lessons we have learnt so far, and identify
enquiry. It brings together evidence from six different countries:
Japan, Spain, Sweden and the United Kingdom, covering the pand
temporal lengths. Systematic patterns emerge. A first commonali

RESEARCH ARTICLE

WILEY

Urban exodus? Understanding human mobility in Britain during the COVID-19 pandemic using Meta-Facebook data

Francisco Rowe[1] | Alessia Calafiore[2] | Daniel Arribas-Bel[1,3] | Krasen Samardzhiev[1] | Martin Fleischmann[1]

[1]Department of Geography and Planning, University of Liverpool, Liverpool, UK

[2]Edinburgh College of Art, University of Edinburgh, Edinburgh, Scotland, UK

[3]The Alan Turing Institute, British Library, London, England, UK

Correspondence

Abstract

Existing empirical work has focused on assessing the effectiveness of nonpharmaceutical interventions on human mobility to contain the spread of COVID-19. Less is known about the ways in which the COVID-19 pandemic has reshaped the spatial patterns of population movement within countries. Anecdotal evidence of an urban exodus from large cities to rural areas emerged during early phases of the pandemic
ss western societies. Yet, these claims have not been empirically assessed.
ditional data sources, such as censuses offer coarse temporal frequency to
yse population movement over infrequent time intervals. Drawing on a data set
1 million observations from Meta-Facebook users, we aim to analyse the extent

Wang et al. Urban Informatics (2022) 1:15
https://doi.org/10.1007/s44212-022-00018-w

Urban Informatics

ORIGINAL ARTICLE Open Access

Understanding internal migration in the UK before and during the COVID-19 pandemic using twitter data

Yikang Wang[1], Chen Zhong[1*], Qili Gao[1] and Carmen Cabrera-Arnau[2]

Abstract

The COVID-19 pandemic has greatly affected internal migration patterns and may last beyond the pandemic. It raises the need to monitor the migration in an economical, effective and timely way. Benefitting from the advancement of geolocation data collection techniques, we used near real-time and fine-grained Twitter data to monitor migration patterns during the COVID-19 pandemic, dated from January 2019 to December 2021. Based on geocoding and estimating home locations, we proposed five indices depicting migration patterns, which are demonstrated by applying an empirical study at national and local authority scales to the UK. Our findings point to complex social processes unfolding differently over space and time. In particular, the pandemic and lockdown policies significantly reduced the rate of migration. Furthermore, we found a trend of people moving out of large cities to the nearby rural areas, and also conjunctive cities if there is one, before and during the peak of the pandemic. The trend of moving to rural areas became more significant in 2020 and most people who moved out had not returned by the end of 2021, although large cities recovered more quickly than other regions. Our results of monthly migration matrixes are validated to be consistent with official migration flow data released by the Office for National Statistics, but have finer temporal granularity and can be updated more frequently. This study demonstrates that Twitter data is highly valuable for migration trend analysis despite the biases in population representation.

Keywords: Migration, Human mobility, Geocoding, Twitter, COVID-19

1 Introduction

The COVID-19 pandemic has greatly impacted people's location choices (Batty, 2020). National and regional lockdowns, economic depression, and working from home policies have significantly decreased short-term human mobility such as daily trips and tourism, and have also affected people's home location choices – specifically, residents have been moving out of large cities due to the pandemic (Haslag & Weagley, 2021; Willberg et al., migration is the component of understanding population change and the social problems that follow (Clark, 1985). The accurate and timely measurement of changes in internal migration during a pandemic is essential for quantitatively assessing the impact and effectiveness of restrictive policies and to help develop recovery strategies for the post-pandemic phase (Martin & Bergmann, 2021).

Considering the rapid changes of the pandemic, includ-

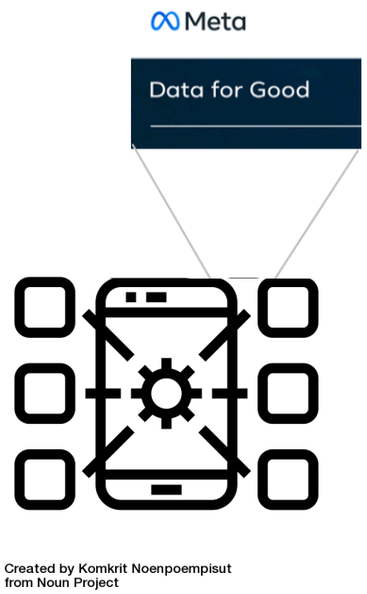
Aim

Analyse the extent and durability of changes in human mobility patterns across the rural-urban continuum in Argentina, Chile, Colombia and Mexico during COVID-19 from March 2020 to May 2022.

Data & Methods

Mobile Phone Data

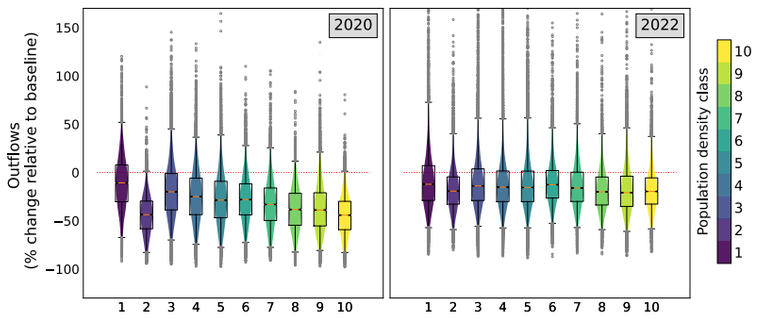
Origin-destination matrix



Created by Komkrit Noenpoempisut
from Noun Project

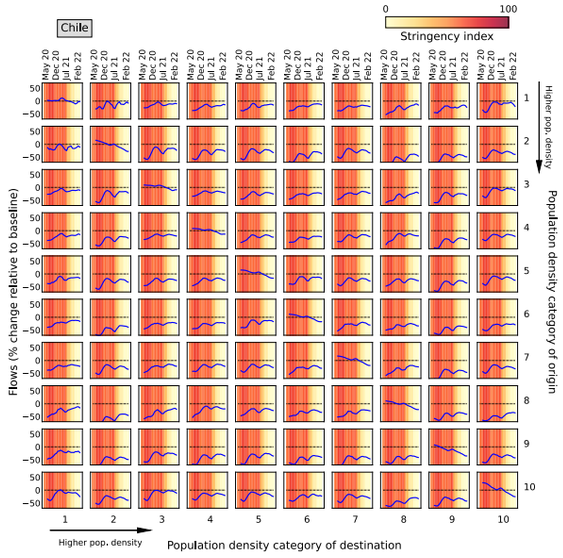
Mobility Indicators

Intensity & Redistribution



Spatio-temporal Interactions

Spatio-temporal variations

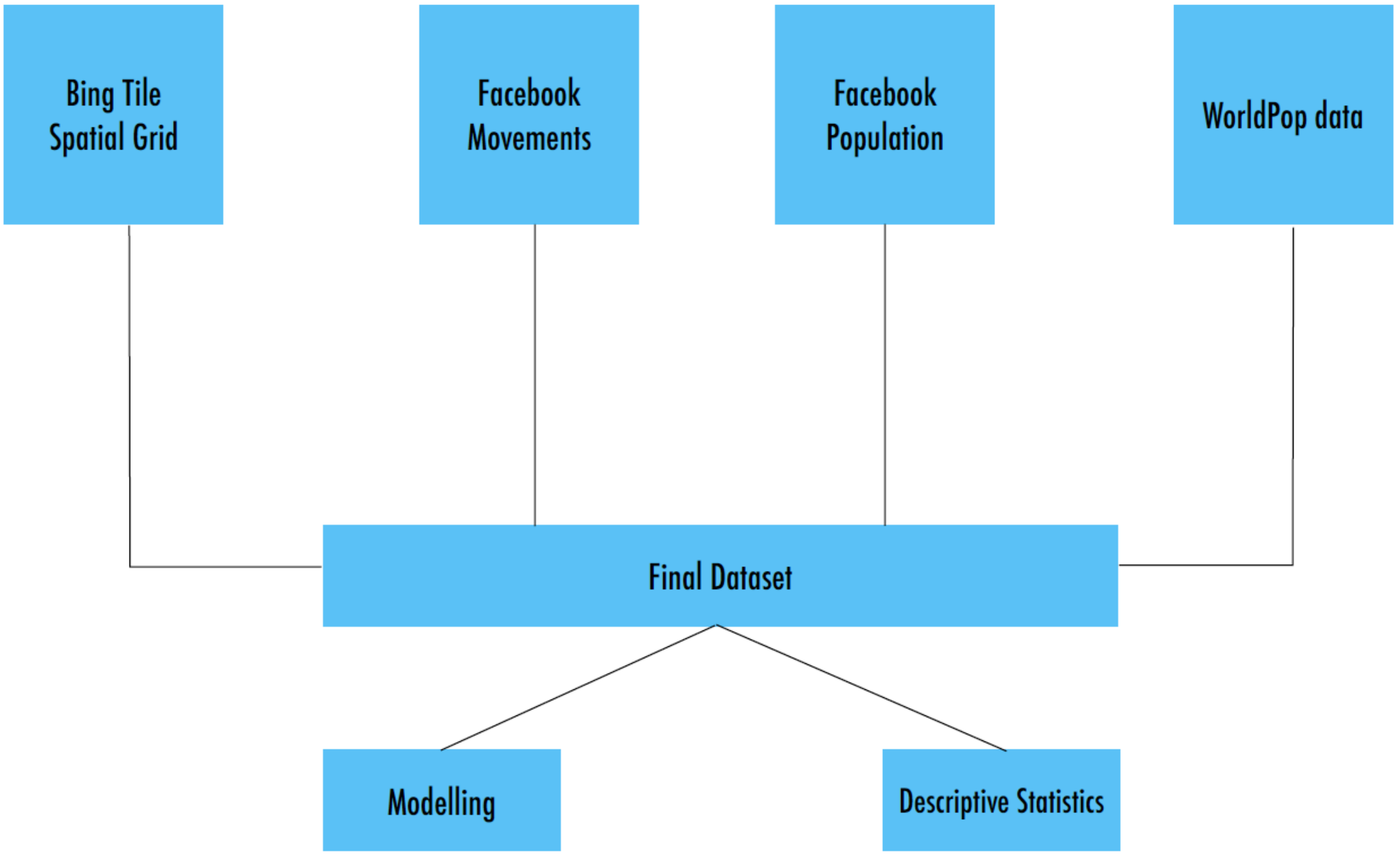


Baseline: 45 days prior to March 10th 2020 5.5-6 km^2

Data

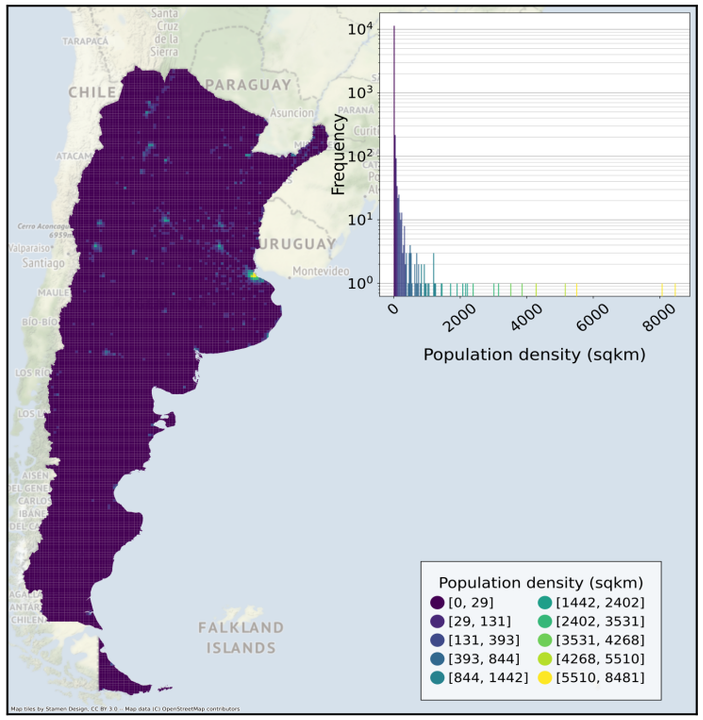
	No. of obs	No. of time periods	No. of tiles	Start Date	End Date
Mexico	105m	2287	6751	02/04/2020	04/05/2022
Argentina	49m	2337	11839	02/04/2020	21/05/2022
Colombia	40m	2398	49324	13/03/2020	21/05/2022
Chile	18m	2215	4451	23/03/2020	31/03/2022

Data Engineering

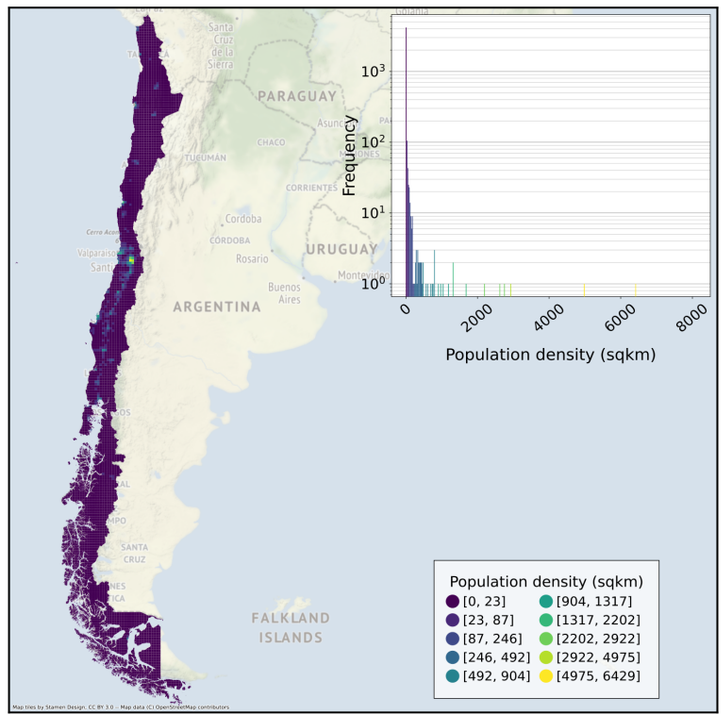


Population density classes

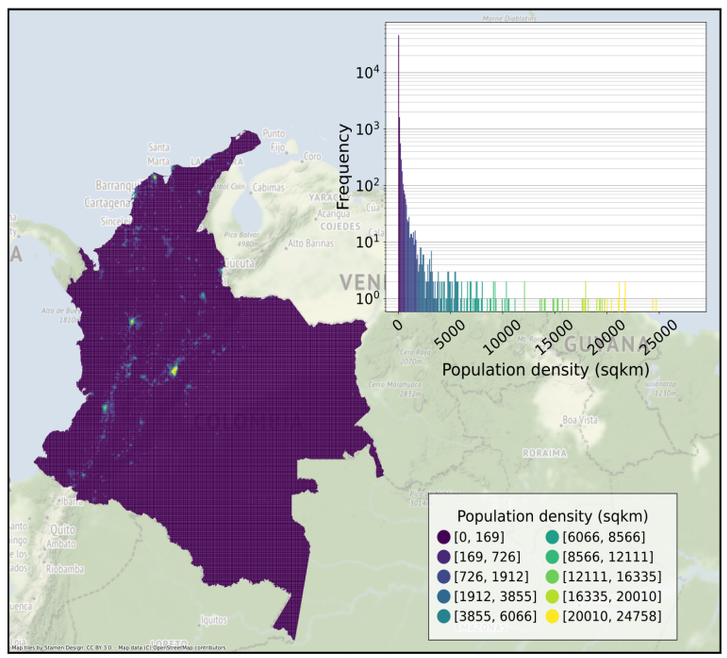
Argentina



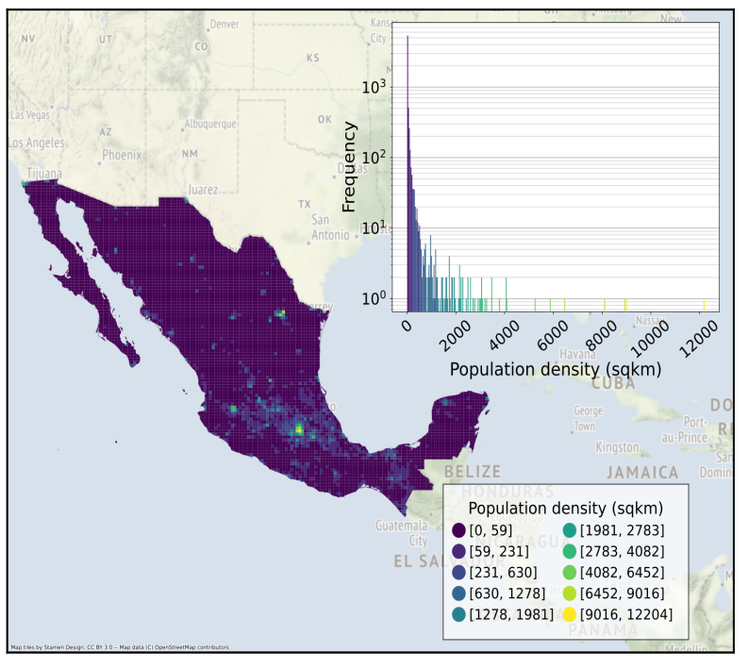
Chile



Colombia

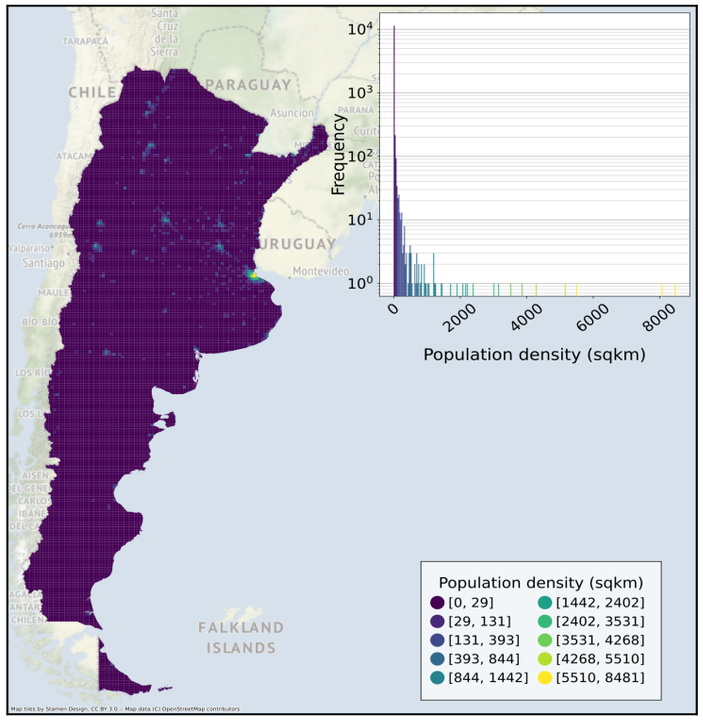


Mexico

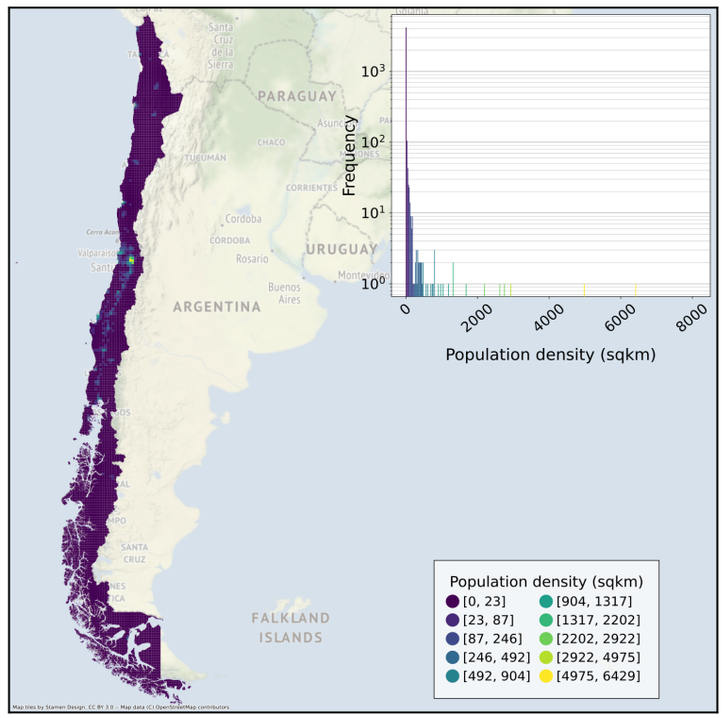


Population density classes

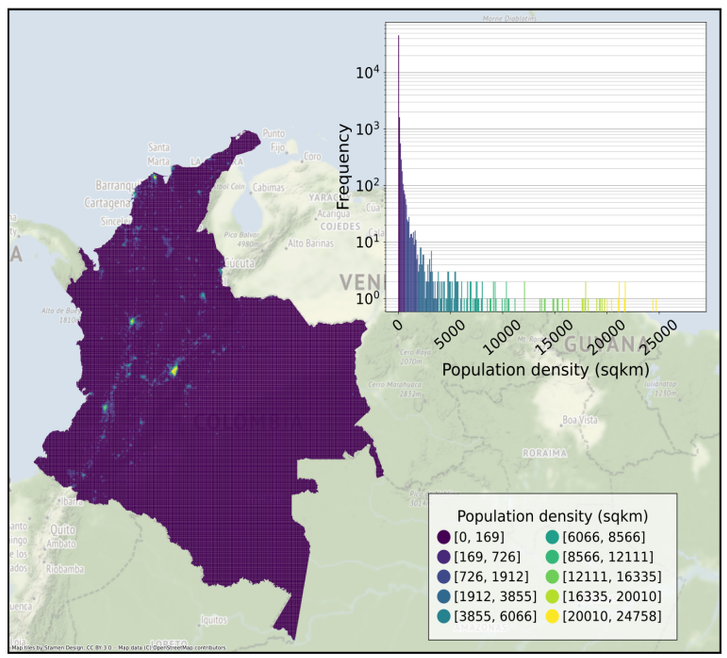
Argentina



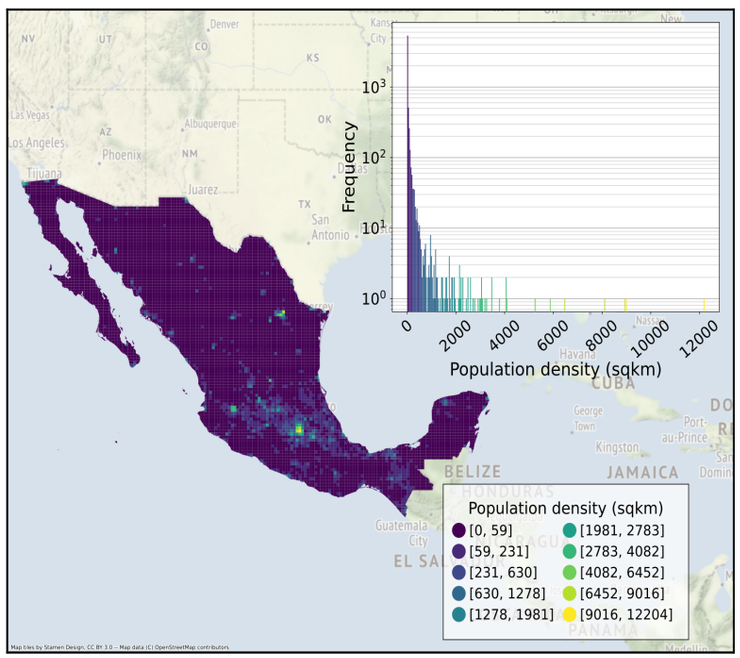
Chile



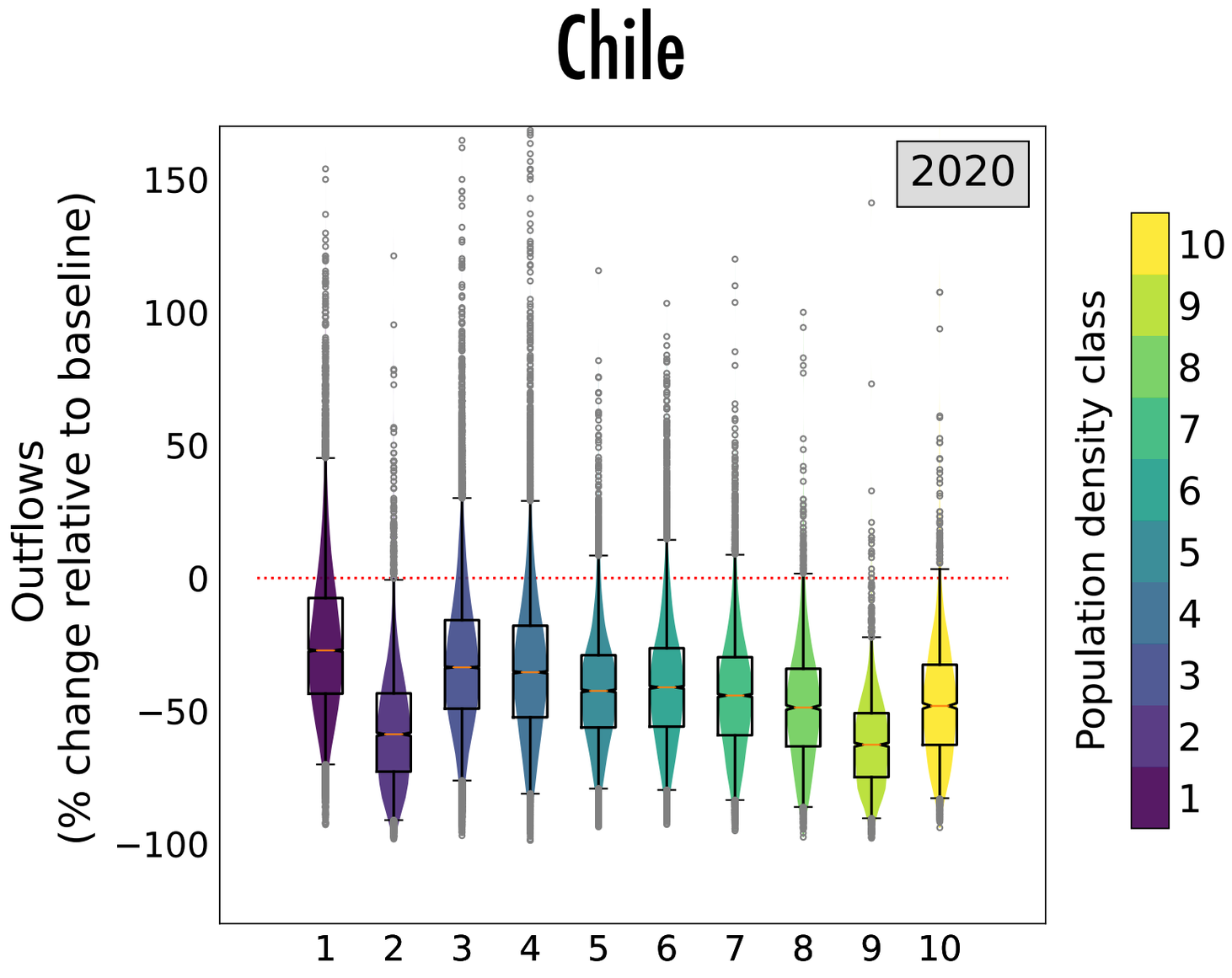
Colombia



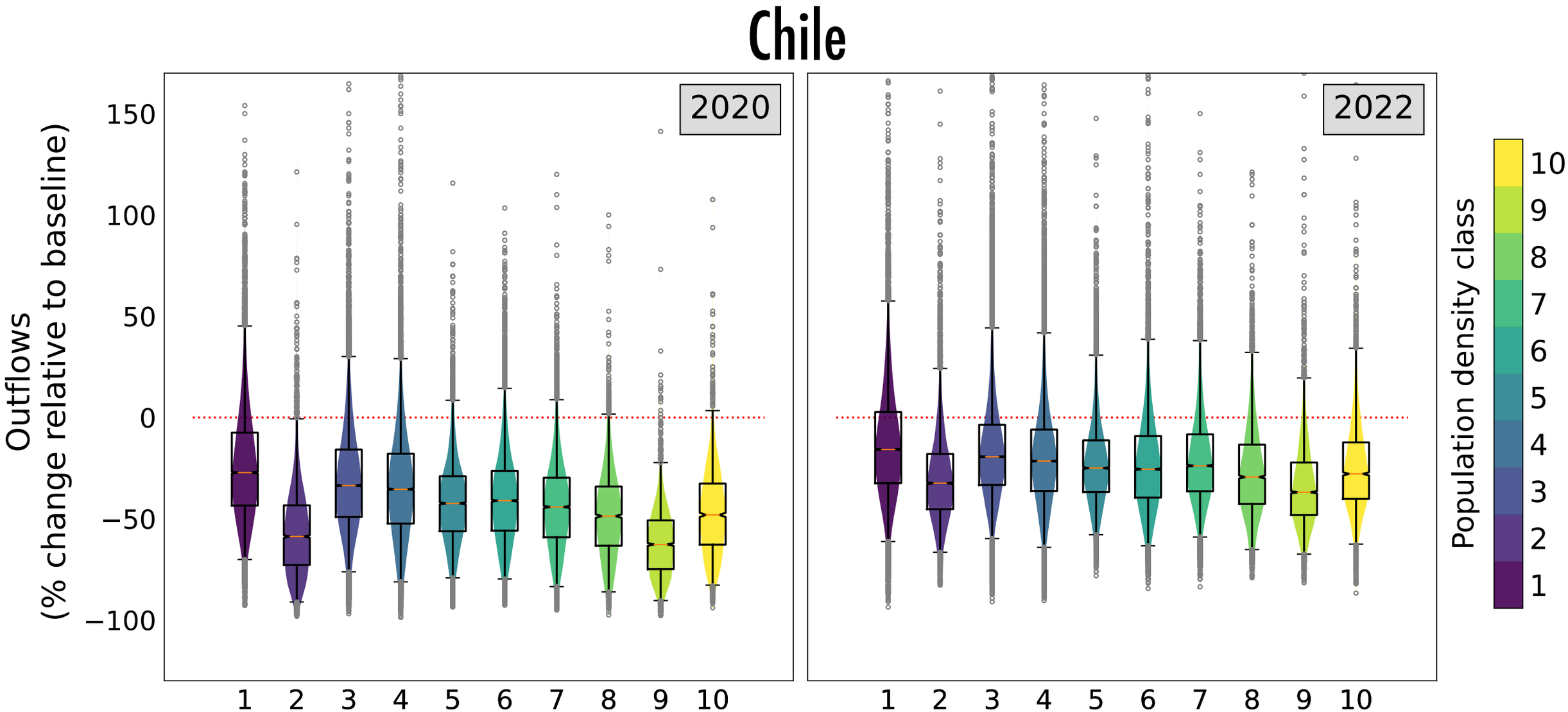
Mexico



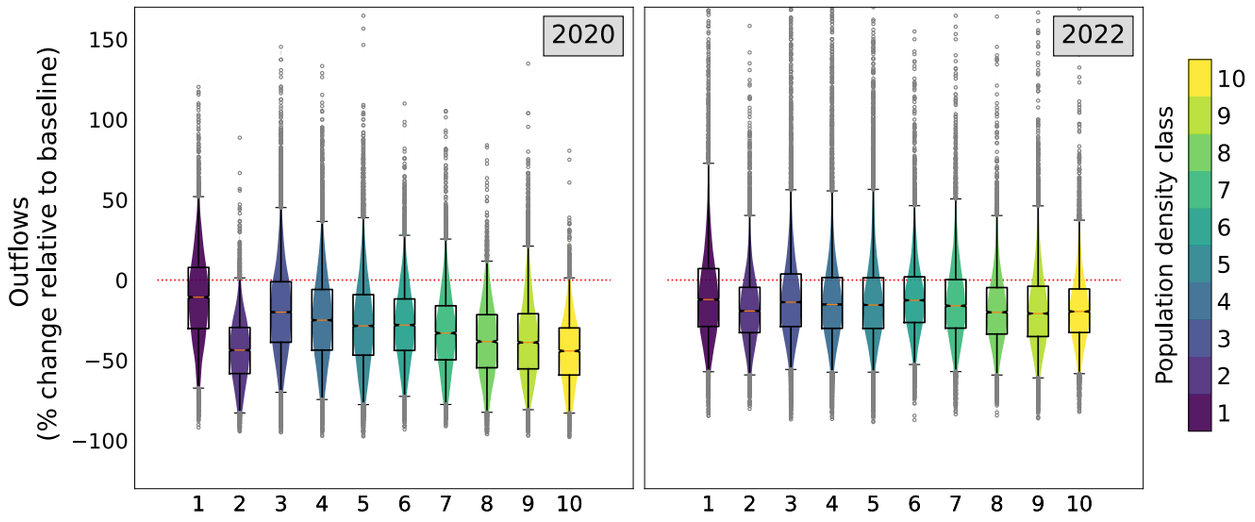
Decline in outflow movement across density classes



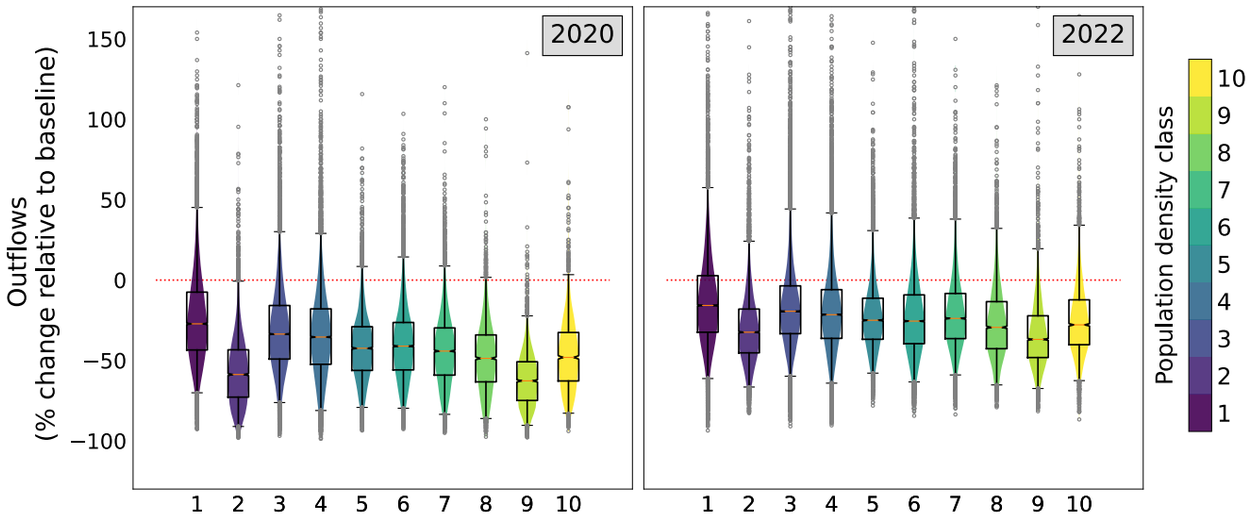
Return closer to pre-pandemic levels



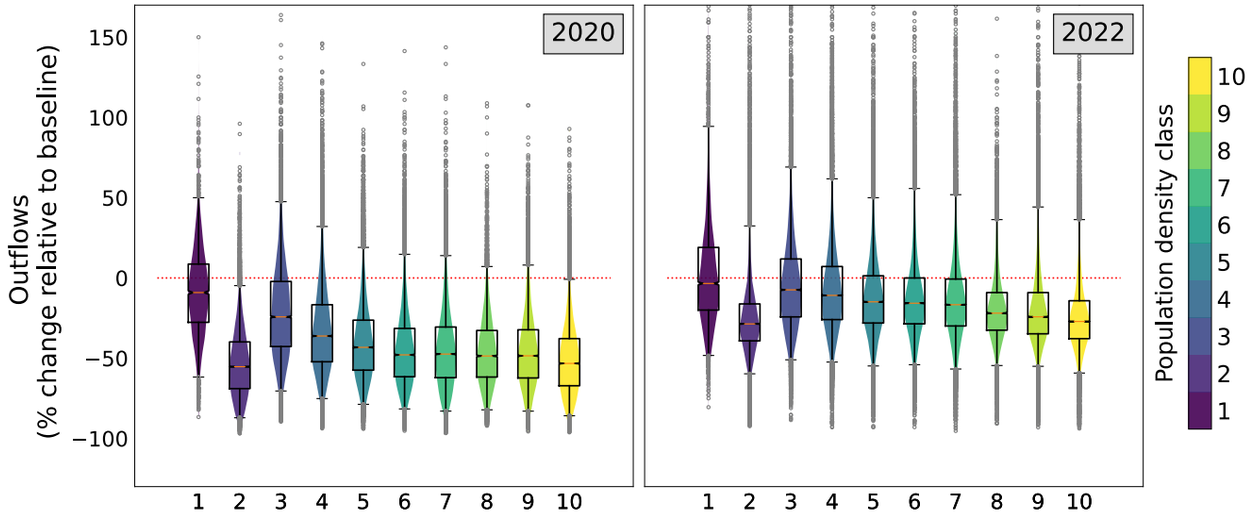
Argentina, Chile & Colombia display similar patterns



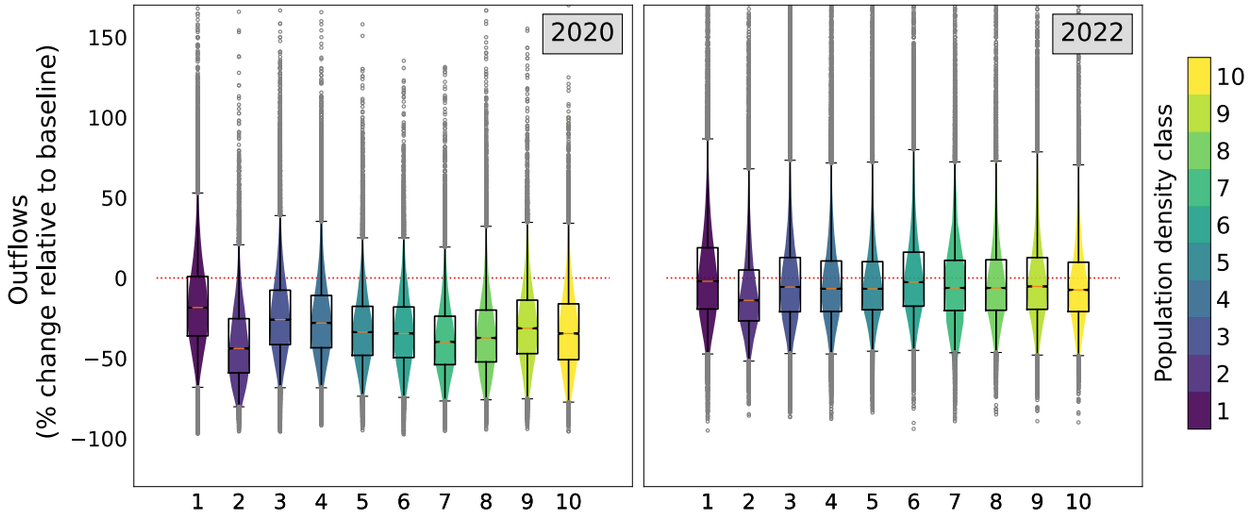
Argentina



Chile

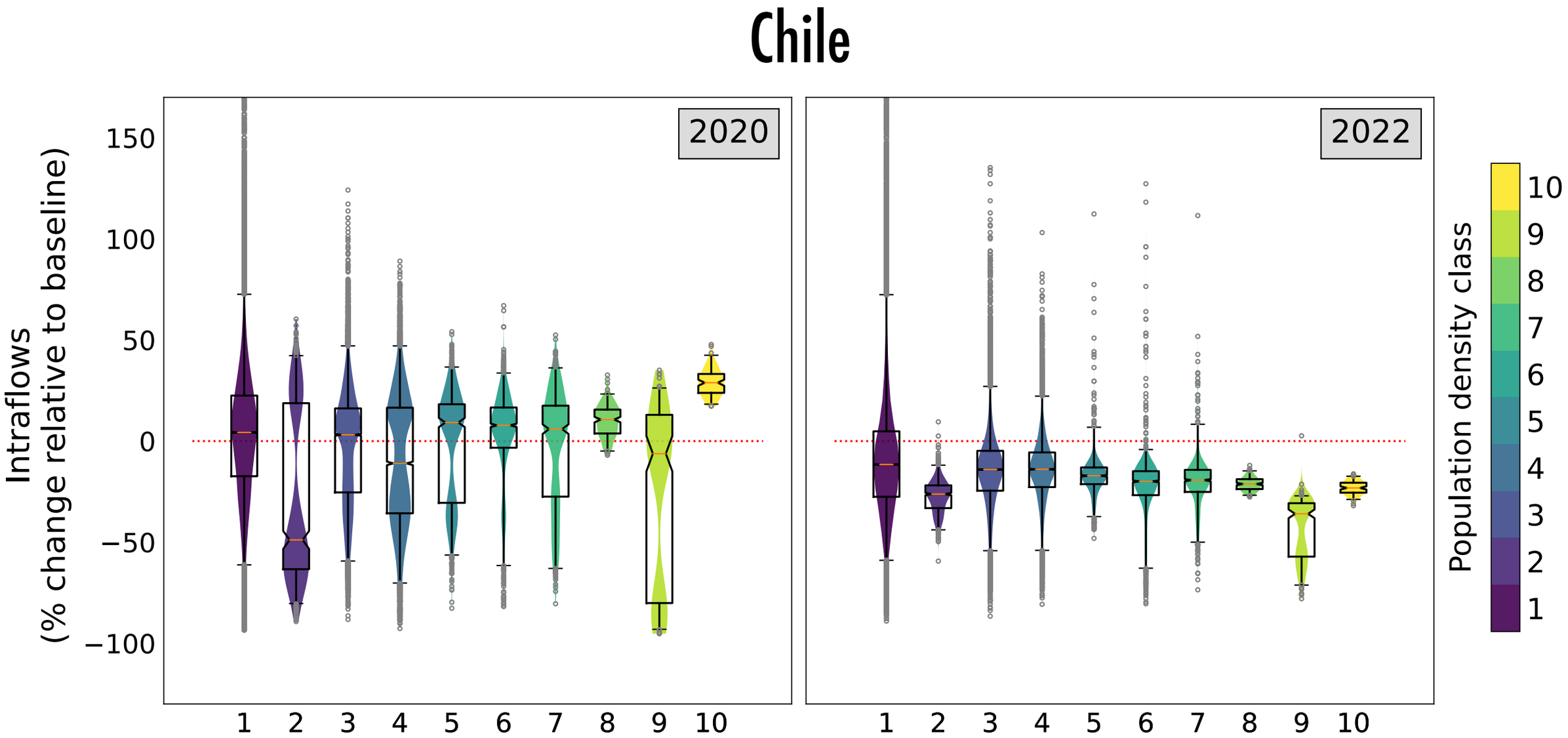


Colombia

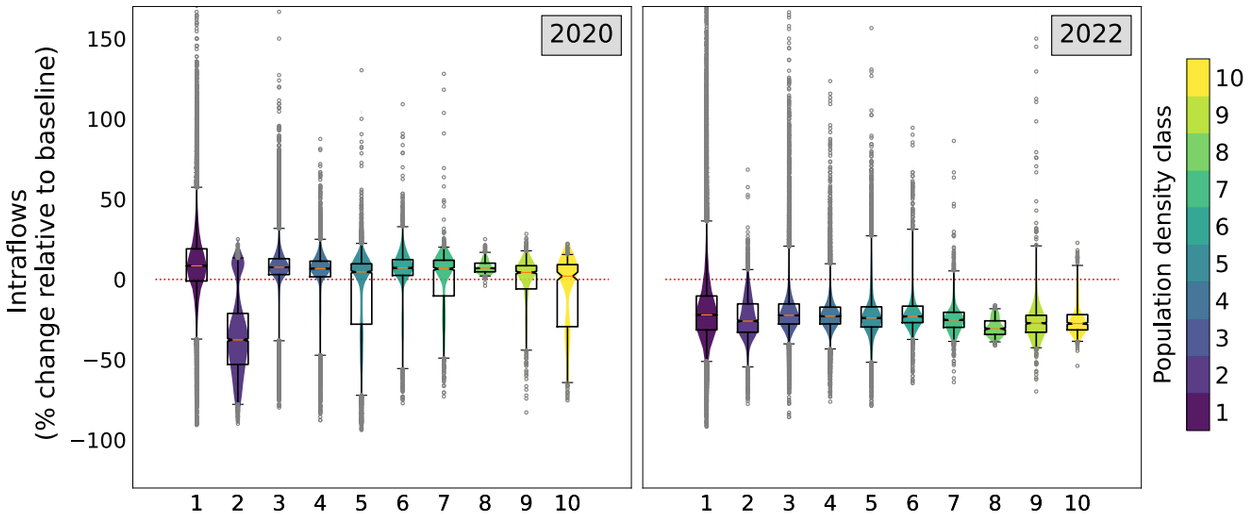


Mexico

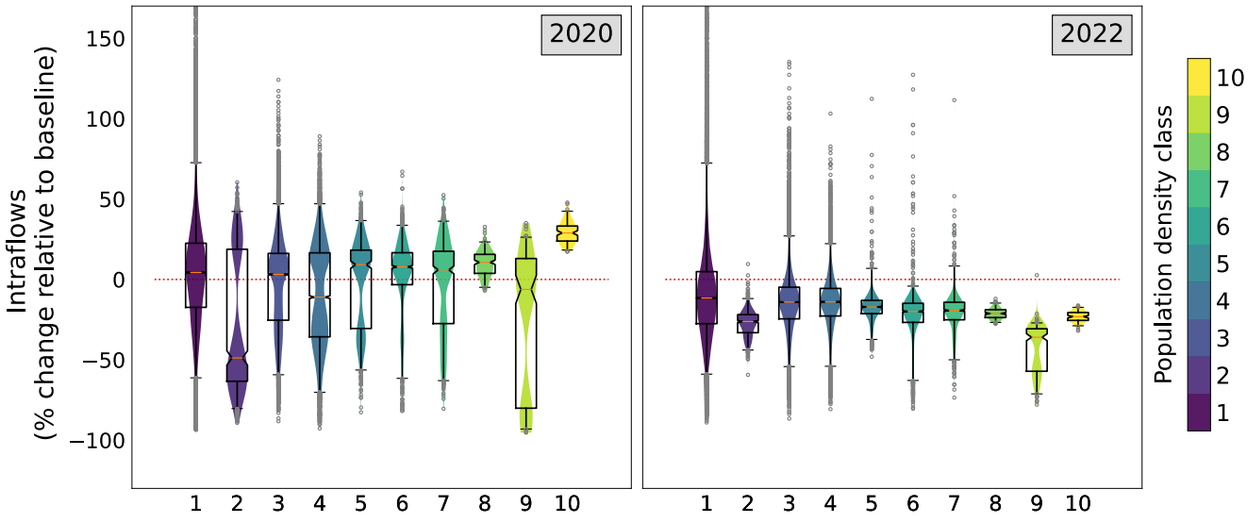
Rise in “intraflows” during early pandemic days but decline in 2022



Mexico displays “intraflows” closer to pre-pandemic levels



Argentina



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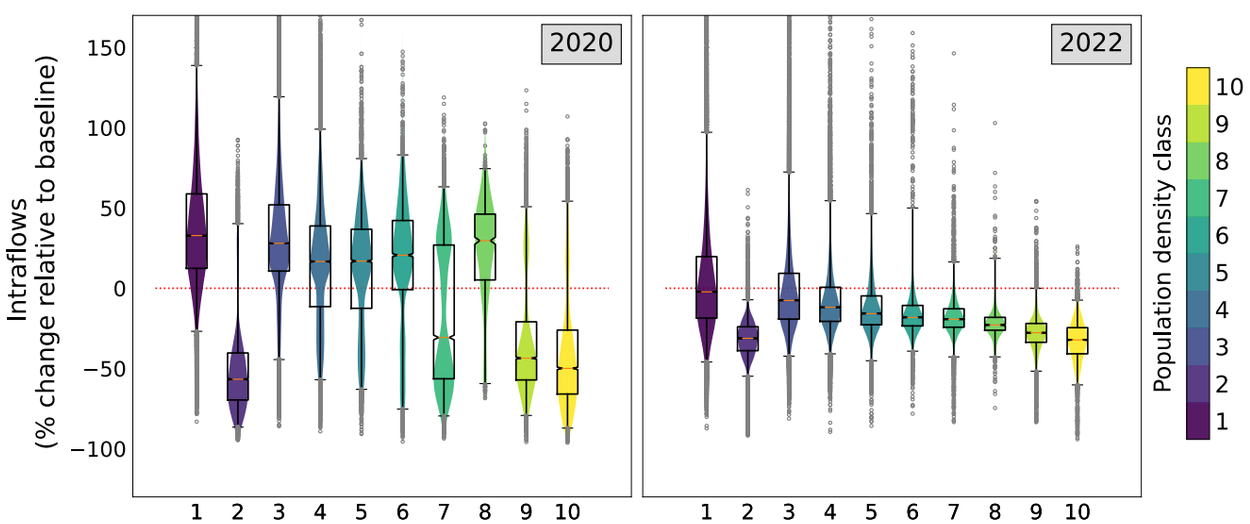
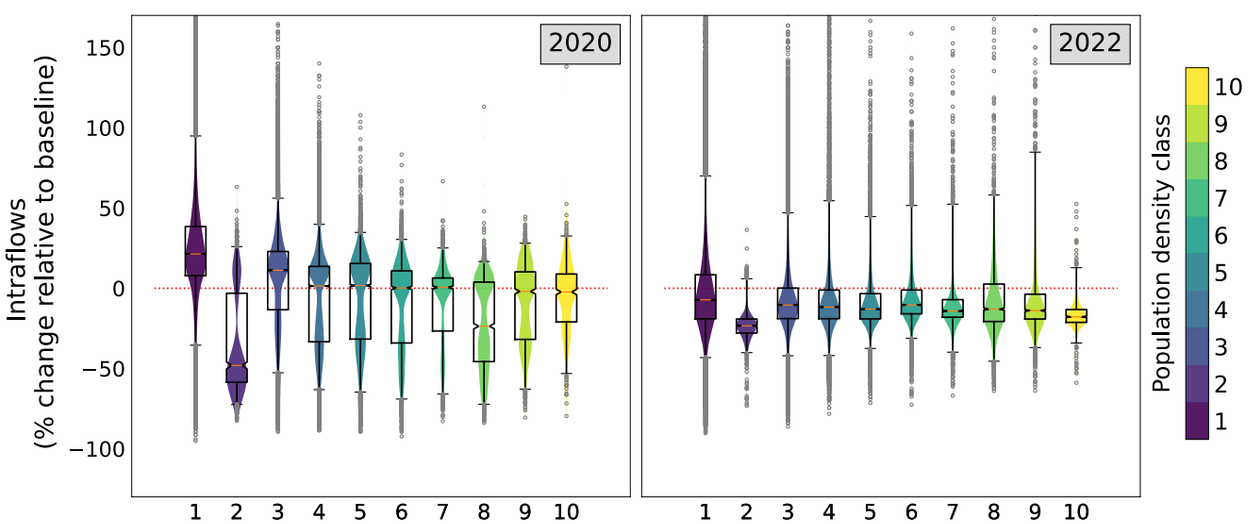
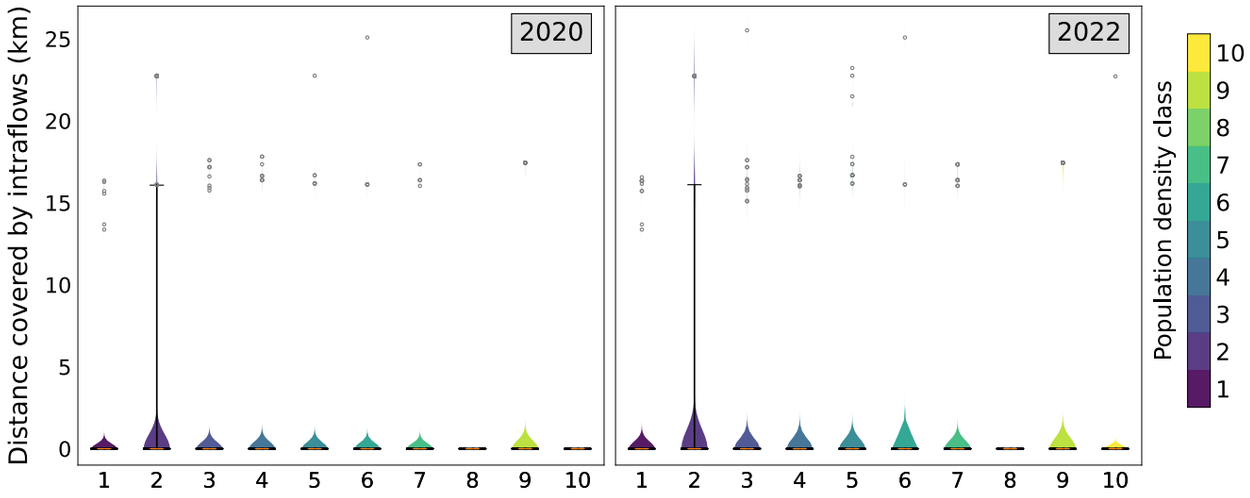


Colombia

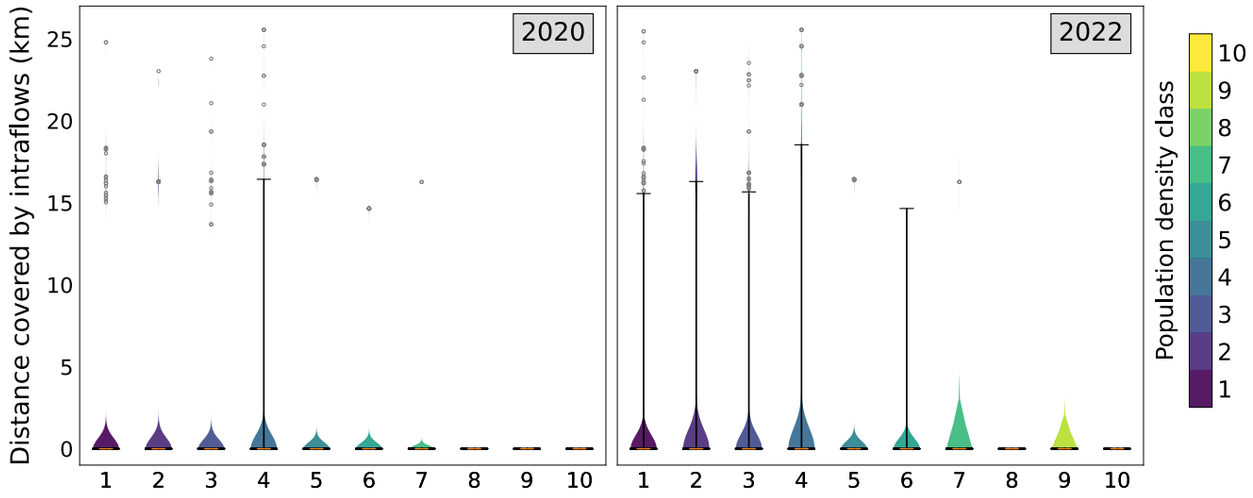


Mexico

Distances expanded over time



Argentina



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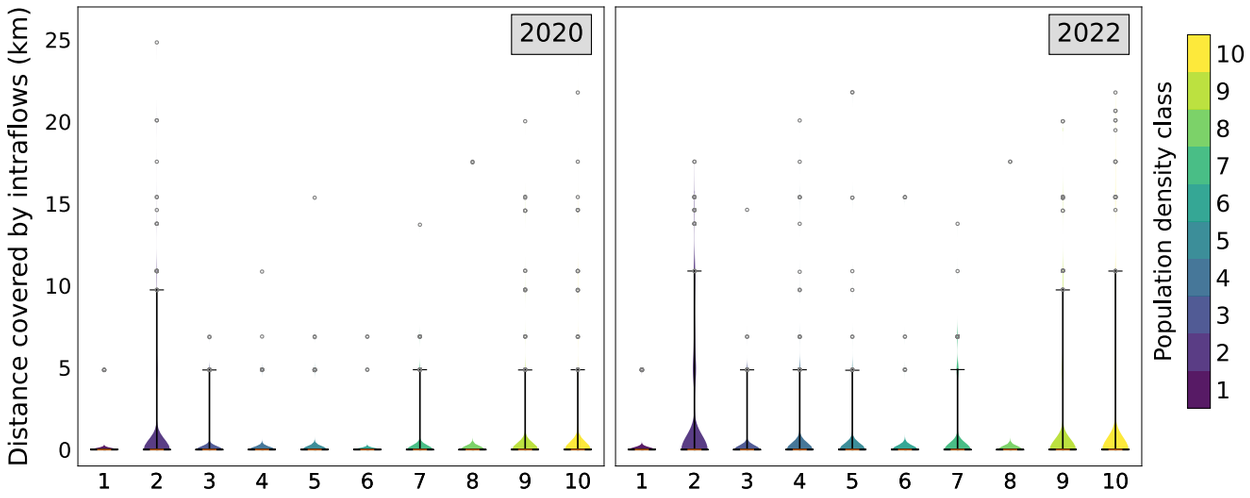
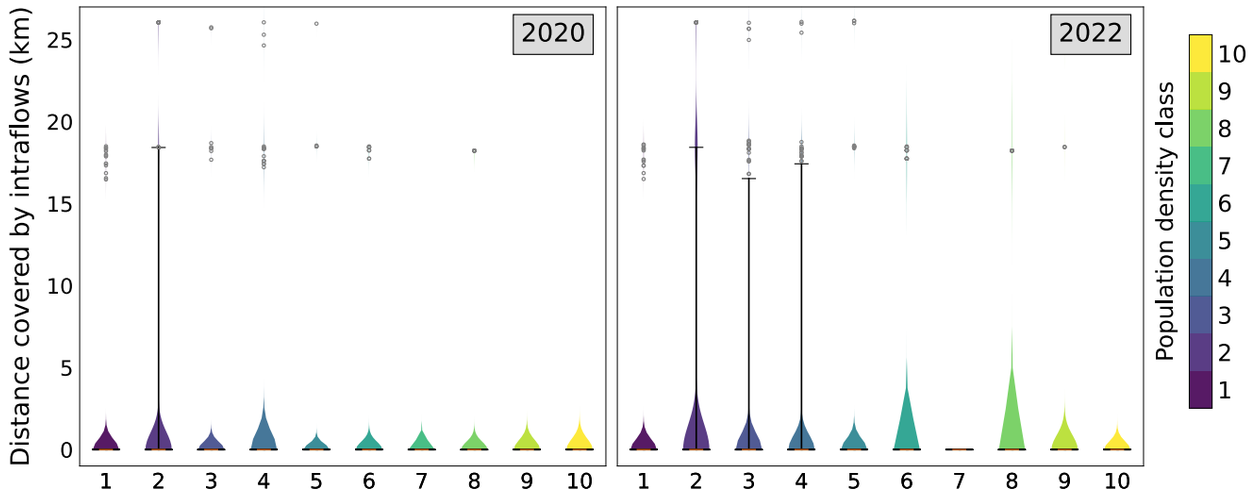
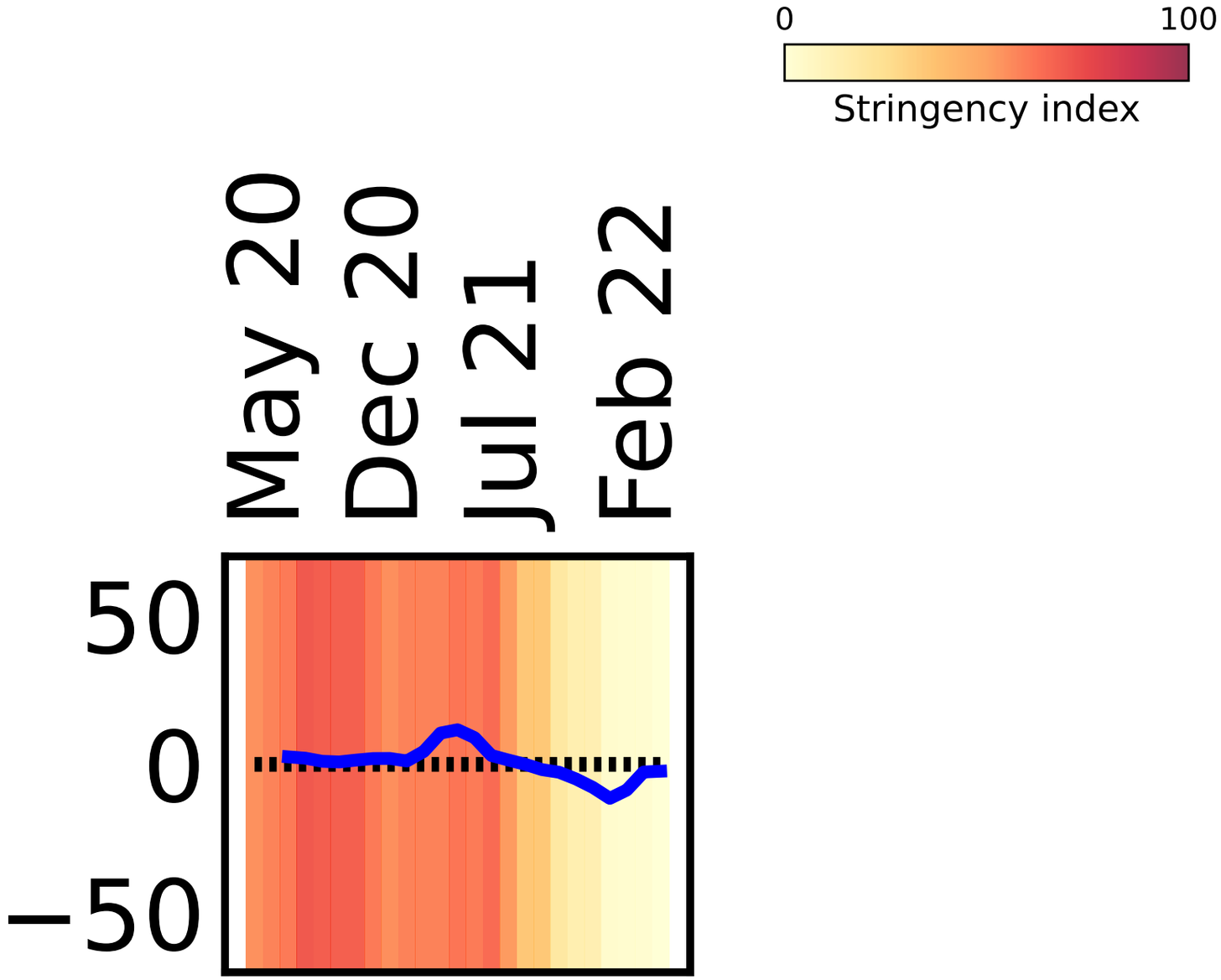


Colombia



Mexico

All origins and destinations



Chile

0 100

Stringency index

May 20 Dec 20 Jul 21 Feb 22

50 0 −50

Flows (% change relative to baseline)

Higher pop. density

Population density category of origin

1 2 3 4 5 6 7 8 9 10

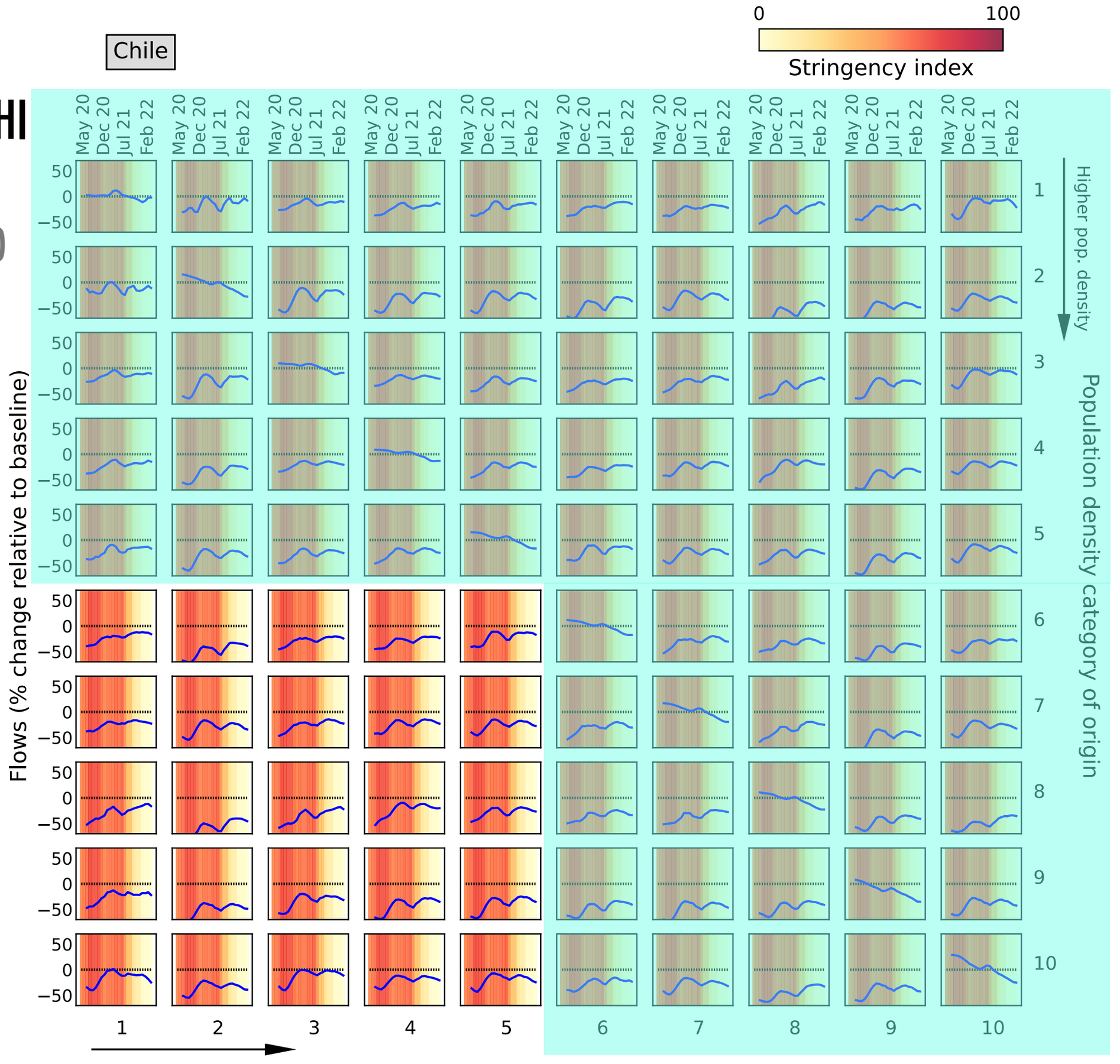
Higher pop. density

Population density category of destination

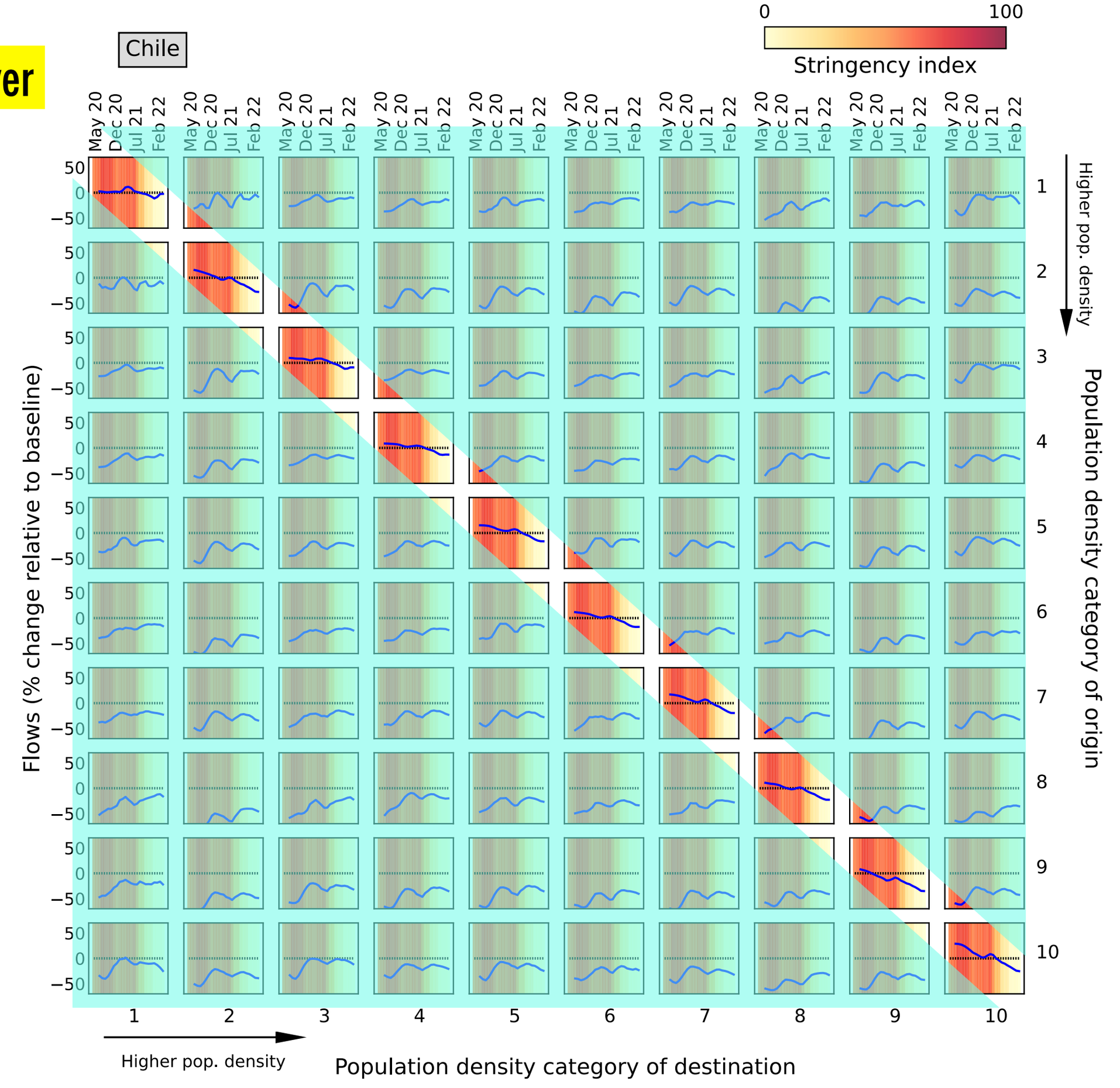
No urban exodus in the early months in ARG, CHI & MEX

- differences post Dec 2020

Higher mobility in Colombia

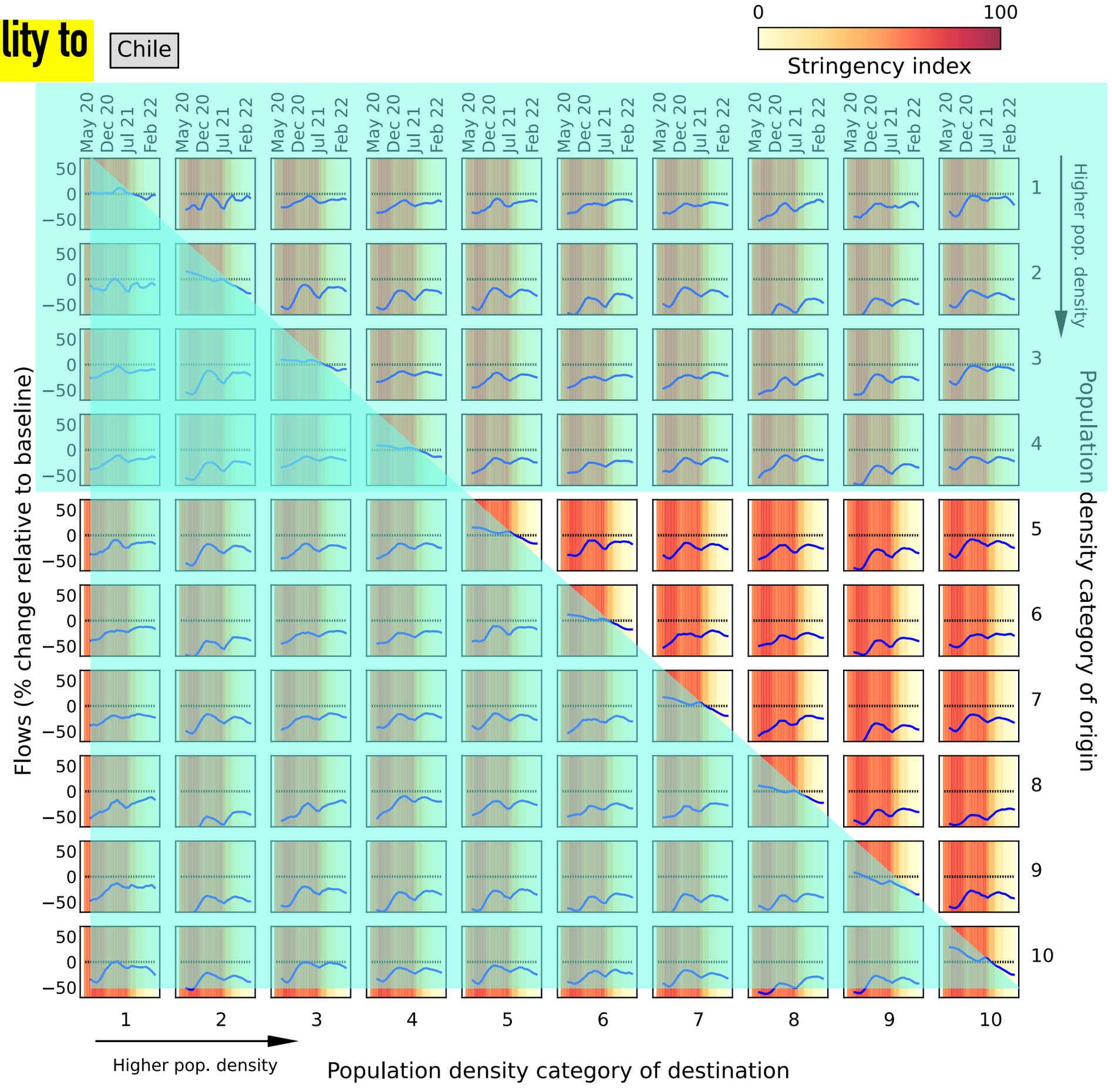


Declining intraflows over time

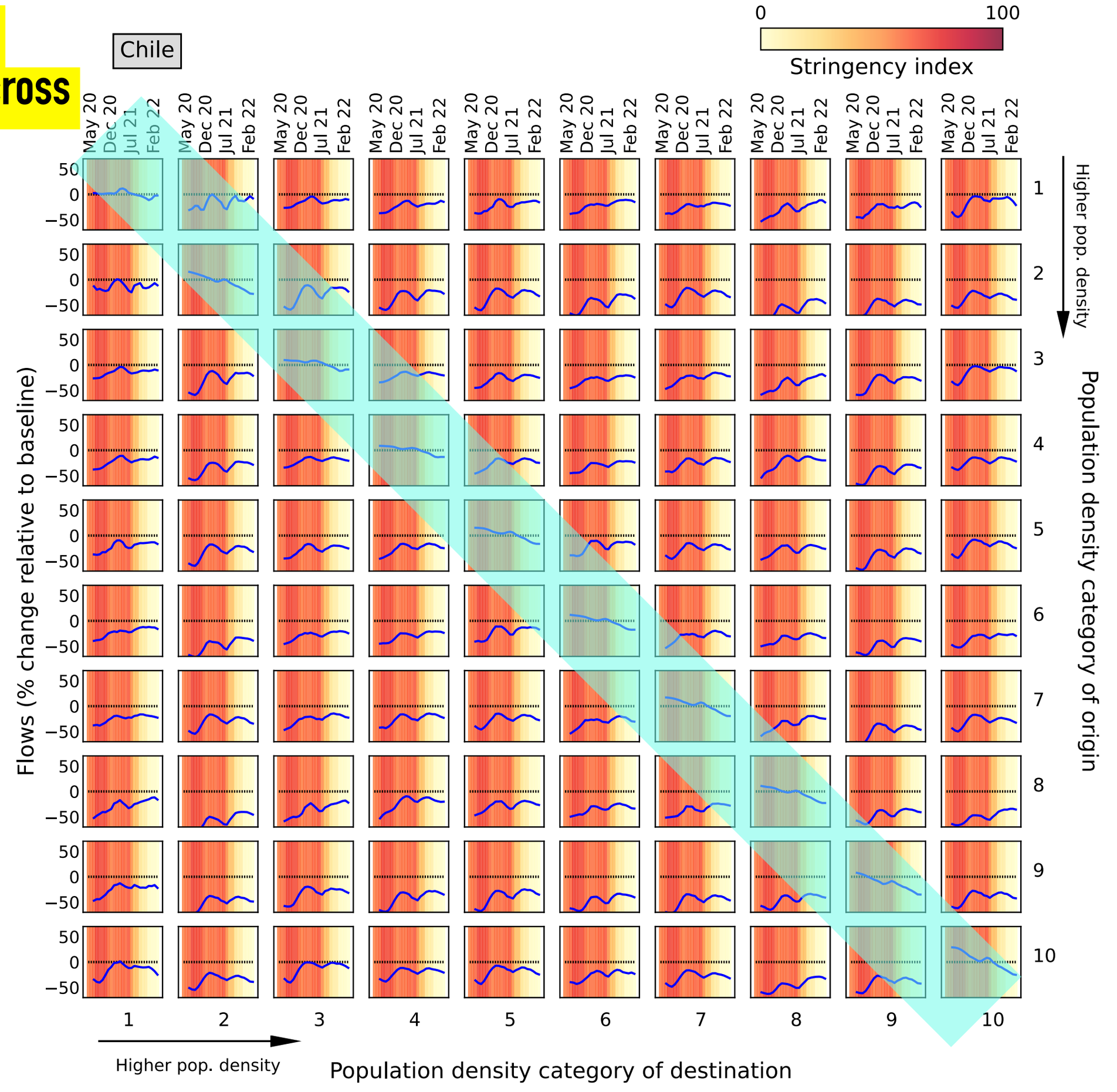


Persistently lower mobility to high density areas

Chile



Persistently systematic reduction in mobility across most density classes



Final Remarks

- Decline in outflows across areas of different density classes in early-days
- Outflows return closer to pre-pandemic levels
- Rise in “intraflows” during early pandemic days but decline in 2022
- The patterns in Mexico are closer to baseline levels throughout the pandemic
- No urban exodus in the early months in ARG, CHI & MEX
- Persistently systematic reduction in mobility across most density classes

Questions & Comments

Questions

1. How does these patterns match your expectations?
2. Why do you think large cities do not seem to have experienced large scale movement?
3. What populations do you think are linked to lower mobility patterns?
4. What datasets are available to capture area-level socio-economic attributes?

Discussion: Policy Implications

Social policy implications:
Housing, services & transport

Questions

Questions

What do you think are the main implications of lower levels of mobility?

Questions

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1. Main policy areas?

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What do you think are the main implications of lower levels of mobility?

1. Main policy areas?
2. Positive or negative?

Questions

What do you think are the main implications of lower levels of mobility?

1. Main policy areas?
2. Positive or negative?
3. Origin vs destination areas

Data implications:
Data accessibility & training

Questions

Questions

1. What do you think is the added value of using digital footprint data for mobility?

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2. What are the potential pathways and current barriers to access these data?

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1. What do you think is the added value of using digital footprint data for mobility?
2. What are the potential pathways and current barriers to access these data?
3. What are the training needs for capacity building?

Potential Collaborative Projects

Questions

Questions

1. What areas of collaboration do you think we can develop?

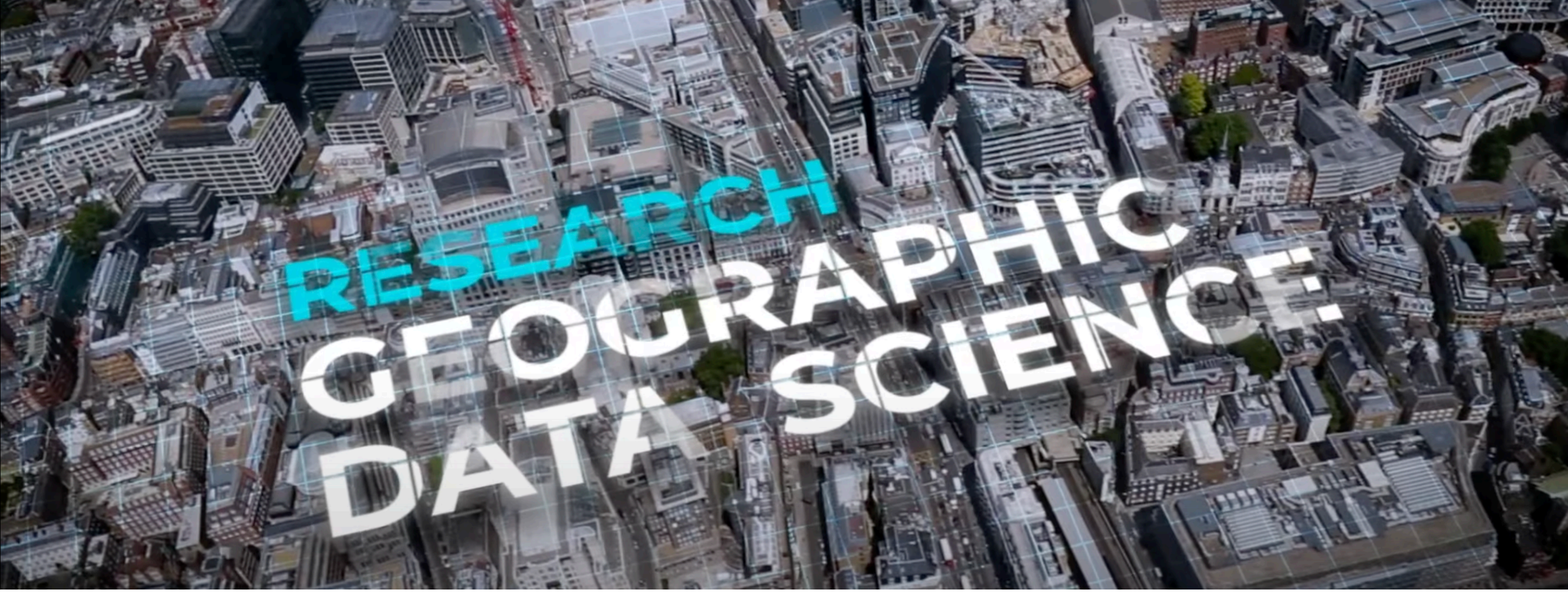
Questions

1. What areas of collaboration do you think we can develop?
2. How can we develop these collaborative projects?

Questions

1. What areas of collaboration do you think we can develop?
2. How can we develop these collaborative projects?
3. What areas of training capacity are needed in your organisation? And can we contribute to their development?

Wrap Up



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