Sensing population displacement from Ukraine using Facebook data: Identifying potential settlement areas within host countries

GDSL- KRIHS Knowledge Expansion Day

9th June 2023

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Context

- The escalation of armed conflict in Ukraine on 24th February 2022 has triggered the **largest refugee crisis in Europe since WWII** (Murray, 2022)

- There are currently over **8 million refugees from Ukraine** recorded across Europe

- Data from the UN have identified key destination countries for refugees, but less is known about the **areas within countries** where refugees are settling

- **Poland** has received the largest number of refugees (~1.6m) followed by **Czech Republic** (500 + thousand), **Slovakia** (113 + thousand), **Moldova** (107+ thousand), **Romania** (126 + thousand) and **Hungary** (34 + thousand)

- Other non-neighbouring destinations also have been important receivers of Ukrainian refugees: **Germany** (1 m +); **UK** (~ 200 thousand); **Spain** (~ 170 thousand); **Italy** (~ 170 thousand); **Turkey** (95 + thousand)

Aims

- Pinpoint areas **within key destination countries** which may be **potential settlement** areas for **Ukrainian refugees**

- Understand the **impact** this could have on **local economies** based on **population density** and **unemployment levels** to allow for **adequate humanitarian assistance**

Rationale

- Displaced populations are in need of **protection and humanitarian assistance** to ensure their safety, health, and well-being
- Displaced populations also have an impact on the **local infrastructure** of the receiving areas and will require **employment opportunities**
- **Highly geographical data in real time are critical** to identify and assess population displacement in host settlement areas in order to ensure appropriate humanitarian aid
- **Traditional data sources are constrained** to render information at high temporal and geographical resolution; digital footprint data have emerged as a key source of information, offering an opportunity to capture human population movements at highly geographical and temporal scales (Rowe, 2023)

Research Questions

1. Which are the main potential settlement areas of Ukrainian refugees within receiving countries?

2. What is the role of existing diasporas in shaping the settlement patterns of refugees within receiving countries?

3. Which type of regions are absorbing Ukrainian refugees? Are they settling in urban or rural areas?

4. Are refugees settling in areas with employment opportunities?

Data

- UNCHR data on the number of Ukrainian refugees
- Eurostat data on the number of Ukrainian diaspora at the national level
- Number of Facebook Daily Active Users (DAU) who use Ukrainian as the main language from Facebook marketing API
- Facebook Social Connectedness Index (SCI) with Ukraine prior to invasion
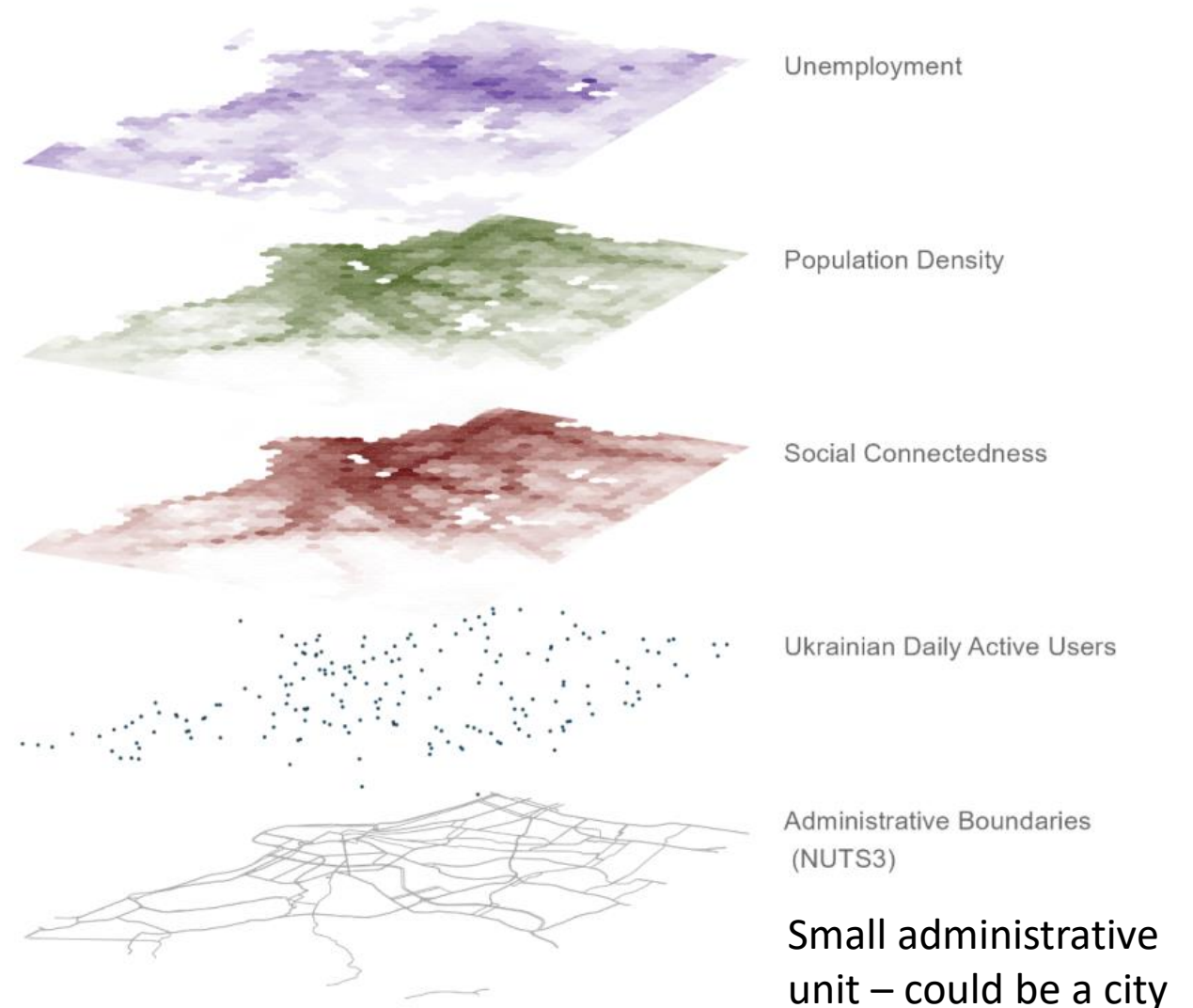- Population and labour market data from Eurostat

Unemployment

Population Density

Social Connectedness

Ukrainian Daily Active Users

Administrative Boundaries (NUTS3)

Small administrative unit – could be a city

Figure 1. Integration of subnational level data

Methods

STAGE 1: ANALYSIS AT NATIONAL LEVEL

- Overview on the main receiving countries of Ukrainian refugees and the role of pre-existing diaspora

- Scatterplot to explore the relationship between size of Ukrainian refugee influx and Ukrainian citizen population

- Draw on refugee data from UNHCR Ukraine Refugee Data Portal dating to mid-April 2023 and Eurostat population counts on Ukrainian citizens living in European countries in 2021

Methods

STAGE 2: IDENTIFYING POTENTIAL SETTLEMENT AREAS WITHIN HOST COUNTRIES AND ASSESSING THE RELATIONSHIP WITH A PRE-EXISTING UKRANIAN DIASPORA

- We use the median number of Facebook users who use Ukrainian as their primary language during social interactions on Facebook between January 28th and February 12th 2023

- Seek to define potential settlement areas by identifying NUTS3 regions with comparatively large numbers of Facebook DAU

- We explore the relationship between these potential settlement areas and pre-existing Ukrainian diaspora using the Facebook Social Connectedness Index as a proxy for Ukrainian diasporas (Bailey, et al. 2018)

- We use scatterplots and bivariate maps to understand these relationships

Methods

STAGE 3: CHARACTERISING POTENTIAL SETTLEMENT AREAS IN TERMS OF POPULATION DENSITY AND EMPLOYMENT OPPORTUNITIES

- Analyse the association between the numbers of Facebook DAU with population density and existing levels of unemployment at NUTS3 level

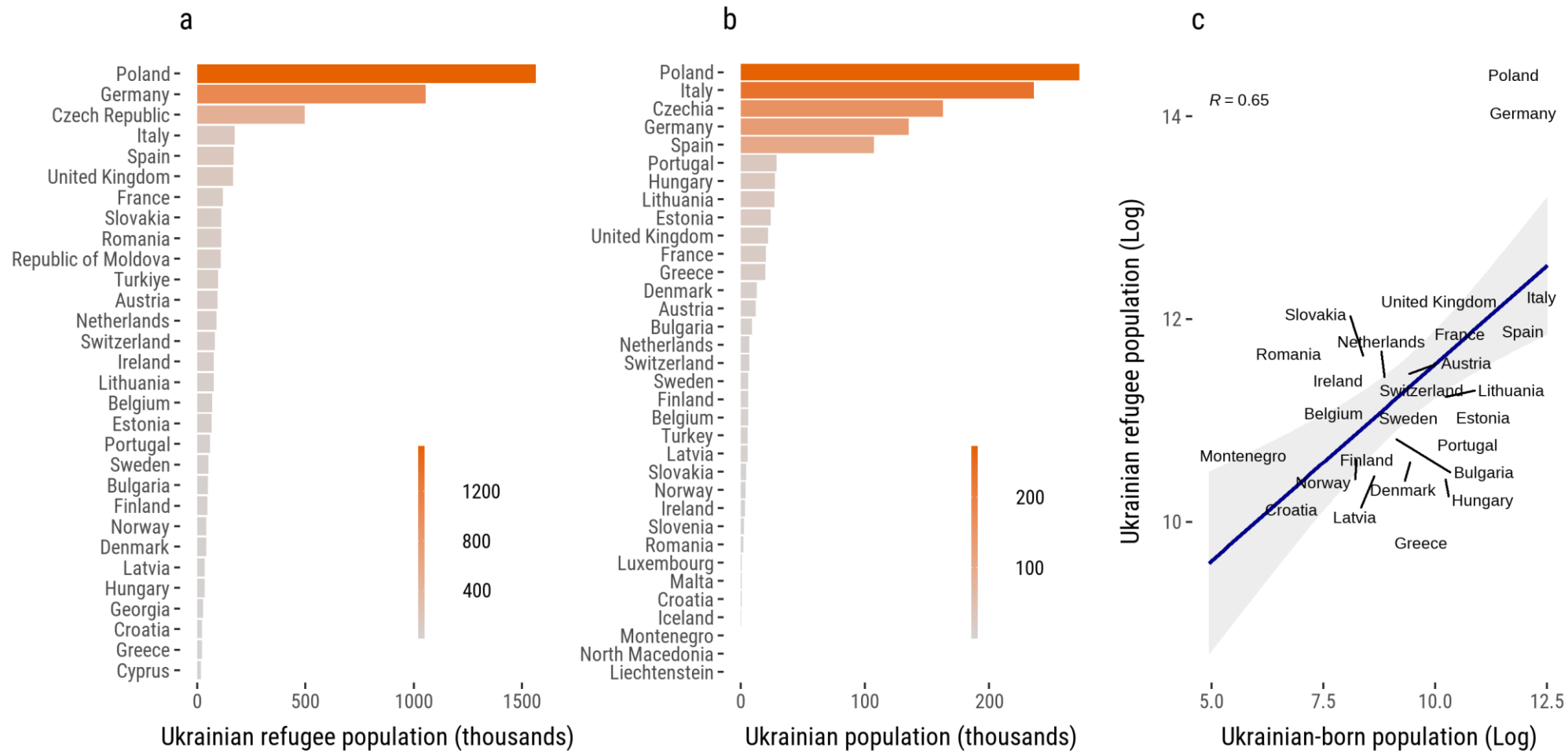- Use scatterplots and bivariate maps

RESULTS: NATIONAL LEVEL

Figure 2. Ukrainian refugee population count by destination country, mid-April 2022 (a), Ukrainian citizenship population count by country, 2021 (b), and Ukrainian refugee population count vs. Ukrainian citizenship population (c).
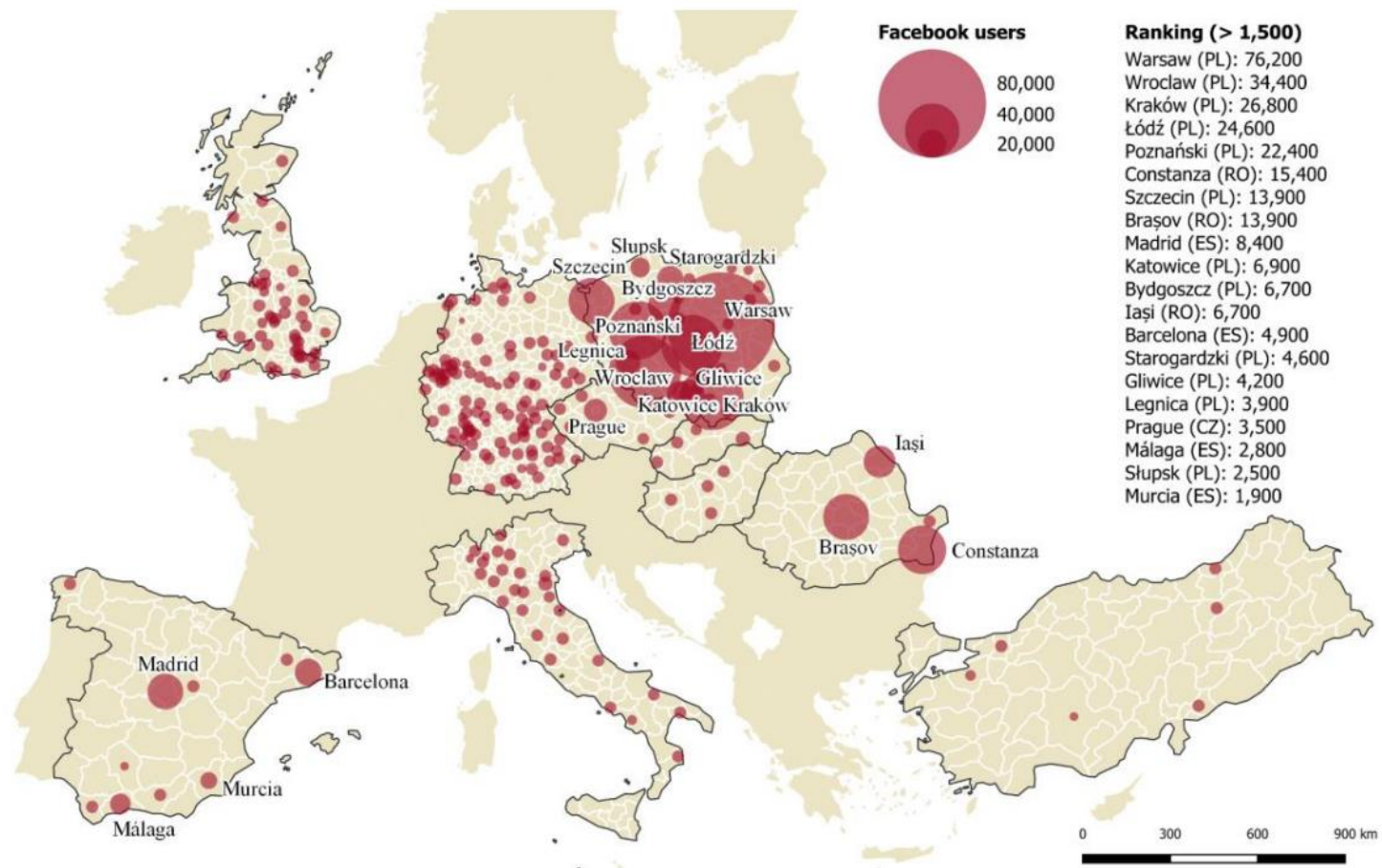
RESULTS: IDENTIFYING POTENTIAL SETTLEMENT AREAS I

Figure 3. Facebook DAU who use Ukrainian as the main language by NUTS 3 regions in countries of interest Median from 28th January – 12th February 2023

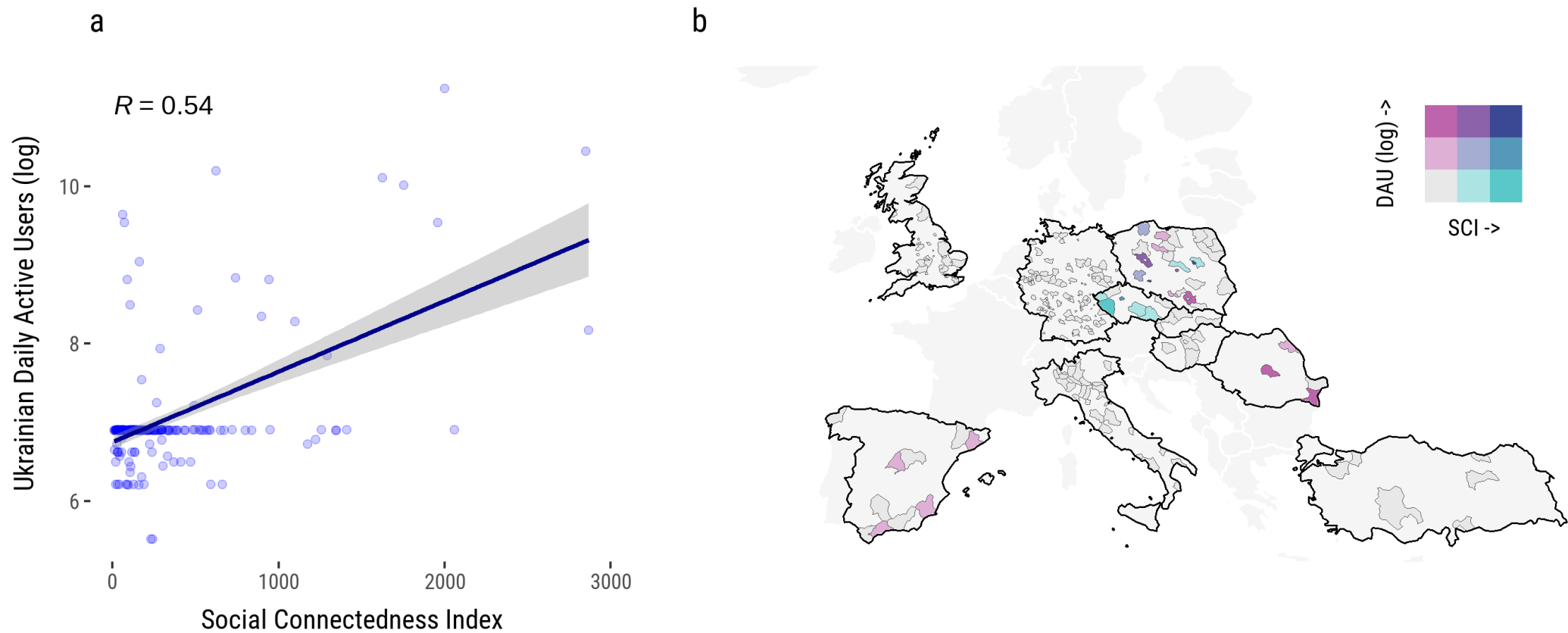# RESULTS: IDENTIFYING POTENTIAL SETTLEMENT AREAS II

Figure 4. Relationship between Facebook DAU who use Ukrainian as the main language (median from 28th January 2023 to 12th February 2023) and the Facebook SCI in August 2020 (a); Map of Facebook DAU who use Ukrainian as the main language vs. Facebook SCI (b)

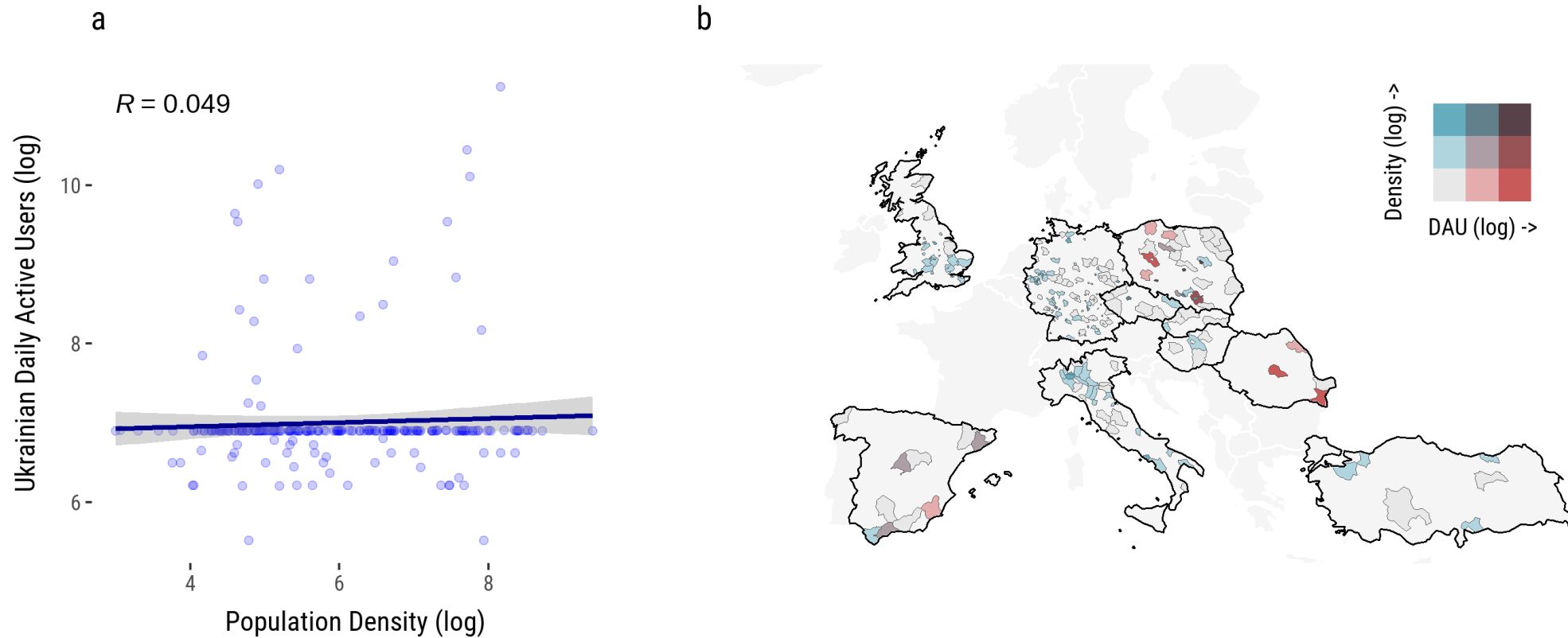# RESULTS: FACEBOOK DAU AND POPULATION DENSITY

Figure 5. Relationship between Facebook DAU who use Ukrainian as the main language (median from 28th January 2023 to 12th February 2023) and population density in 2021 (a); Map of Facebook DAU who use Ukrainian as the main language vs. population density (b)

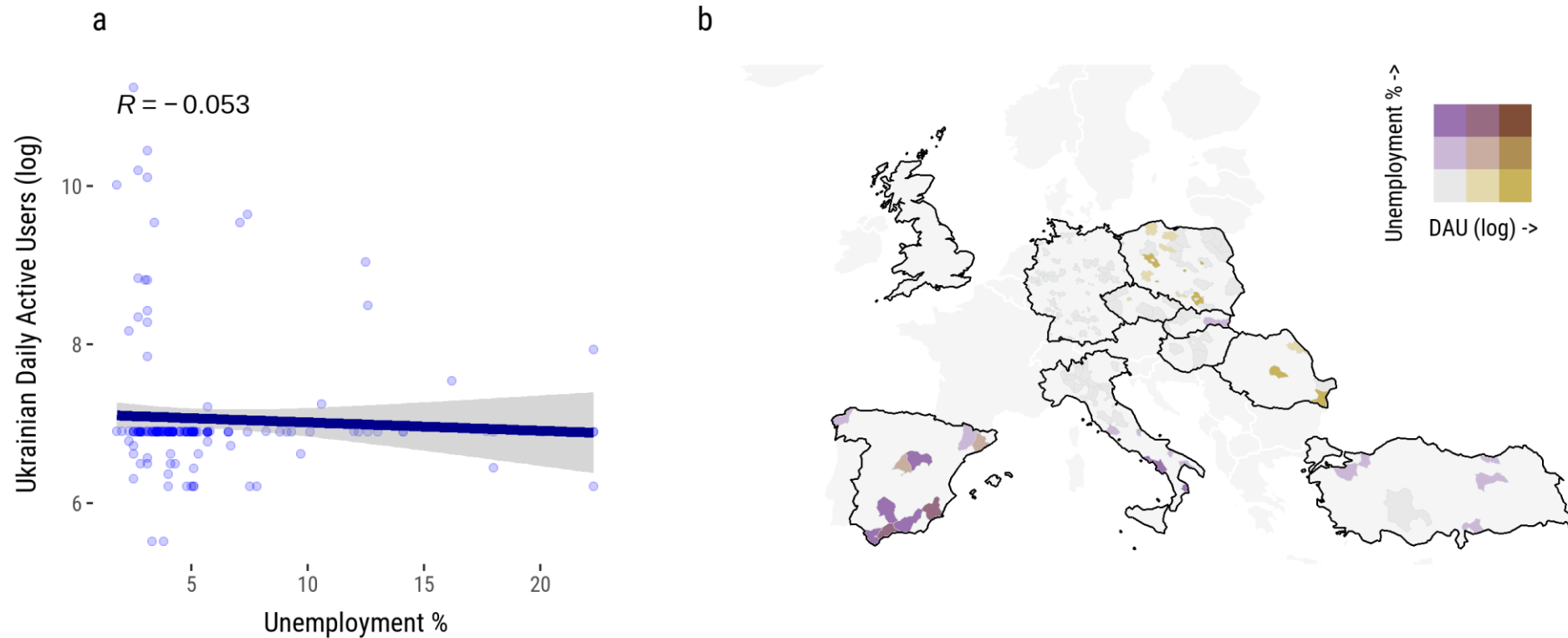# RESULTS: FACEBOOK DAU AND UNEMPLOYMENT

Figure 6. Relationship between Facebook DAU who use Ukrainian as the main language (median from 28th January 2023 to 12th February 2023) and unemployment levels in 2021 (a); Map of DAU vs. unemployment levels (b).

Discussion and Conclusions

- Ukrainian-speaking Facebook users are highly concentrated inareas across: inner, South and Northwestern Poland; Spain; and Czech Republic

- Rural locations in Romania seem to have a large number of users

- Lack of user concentration in bordering regions indicates that these regions may have been used as transit points for refugees

- Concentration of Ukrainian-speaking users in certain Spanish areas with high levels of unemployment, coupled with low levels of diaspora

- Overall, varying Geographical distribution of Ukrainian refugees across European regions, and that different packages of humanitarian assistance may be needed

- Demonstrate the value of digital footprint data to provide near real-time monitoring of unfolding crises

Thank you for listening!
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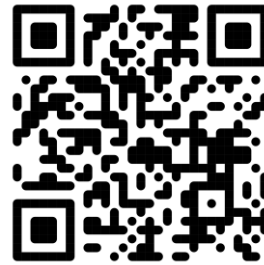
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