

ANNA GASTEN

# Refugee Camps and Host-Community Migration: Evidence from Long-Term Individual Tracking Data

4TH JDC CONFERENCE ON FORCED DISPLACEMENT – JUNE, 5 2026

# Motivation

Refugee camps have an impact on local population via several dimensions

- Environment (-) (*Barman 2020; Salemi 2021*)
- Health; Human capital (-/+)  
(*Baez 2011; Lücke and Schneiderheinze 2020*)
- Infrastructure (+)  
(*Gnowa et al. 2026*)
- Local markets for goods; prices (-/+)  
(*Alix-Garcia and Saah 2009*)
- Local labor markets; wages (-/+)  
(*Ruiz and Vargas-Silva 2016; Schuettler and Vermé 2022*)
- Economic activity; Business creation (+)  
(*Alix-Garcia et al. 2018*)
- Welfare; Consumption (+/-)  
(*Maystadt and Verwimp 2014*);  
(*Alix-Garcia et al. 2018*)

---

## Research Question

- To which extent do refugee camps trigger migratory movements of the local host population?
- Are there heterogenous push/ pull effects depending on the socio-economic background of the host population?

## Hypotheses

- Refugee camps might act as pull factor for individuals that benefit from the improved infrastructure, presence of NGOs and labor market adjustments
- Individuals that suffer most from the presence of refugees could leave the region

# The setting: Tanzania in the 1990s



Tanzania Kagera location map © Sémhur /  
Wikimedia Commons (CC BY-SA 4.0)

- Sudden, unexpected and very large inflows of refugees
- October 21, 1993: Burundian president Ndadaye (Hutu) assassinated by Tutsi soldiers  
→ 300,000 Burundian Hutus fled to Tanzania until end of 1993
- April 28, 1994: Burundian and Rwandan president died; triggering factor of Rwandan genocide  
→ 250,000 Rwandan refugees fled within 24 hours in fear of a civil war
- 1995: 700,000 refugees were living in Kagera; local population: 1.5 mio. individuals

Rwandan refugees entering Tanzania in 04/1994



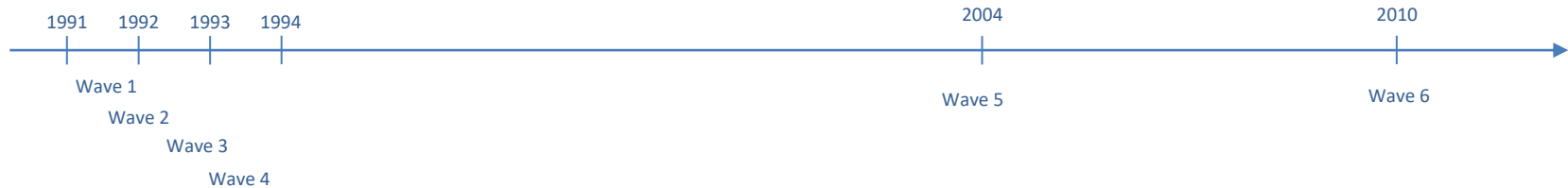
© Martha Rial, *Pittsburgh Post-Gazette*, Pulitzer Prize for Spot News Photography

## The setting: Tanzania in the 1990s

- Unexpectedness together with massive number of people prevented UNHCR and Tanzanian government to purposefully open camps in certain locations (*Maystadt and Verwimp 2014*)
  - camps were opened close to the Rwandan and Burundian border, where refugees were located
  - movement of refugees initially restrained by natural barriers (mountain chains)
  - location is not random

# The data: KHDS

- Kagera Health and Development Survey (KHDS) surveyed **Kageran** households
- World Bank Living Standard Measurement Survey (LSMS)
- Detailed socio-economic panel survey

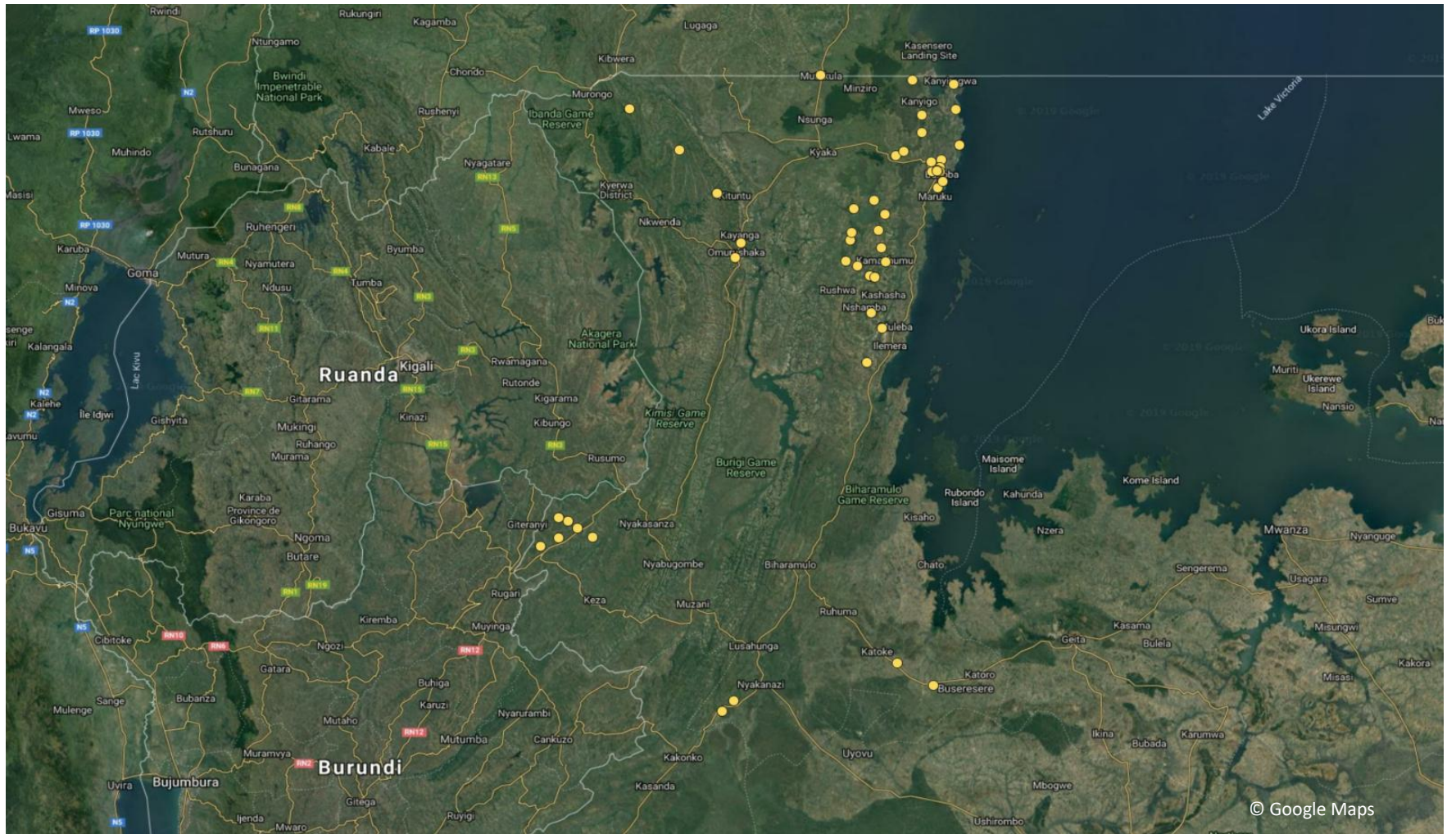


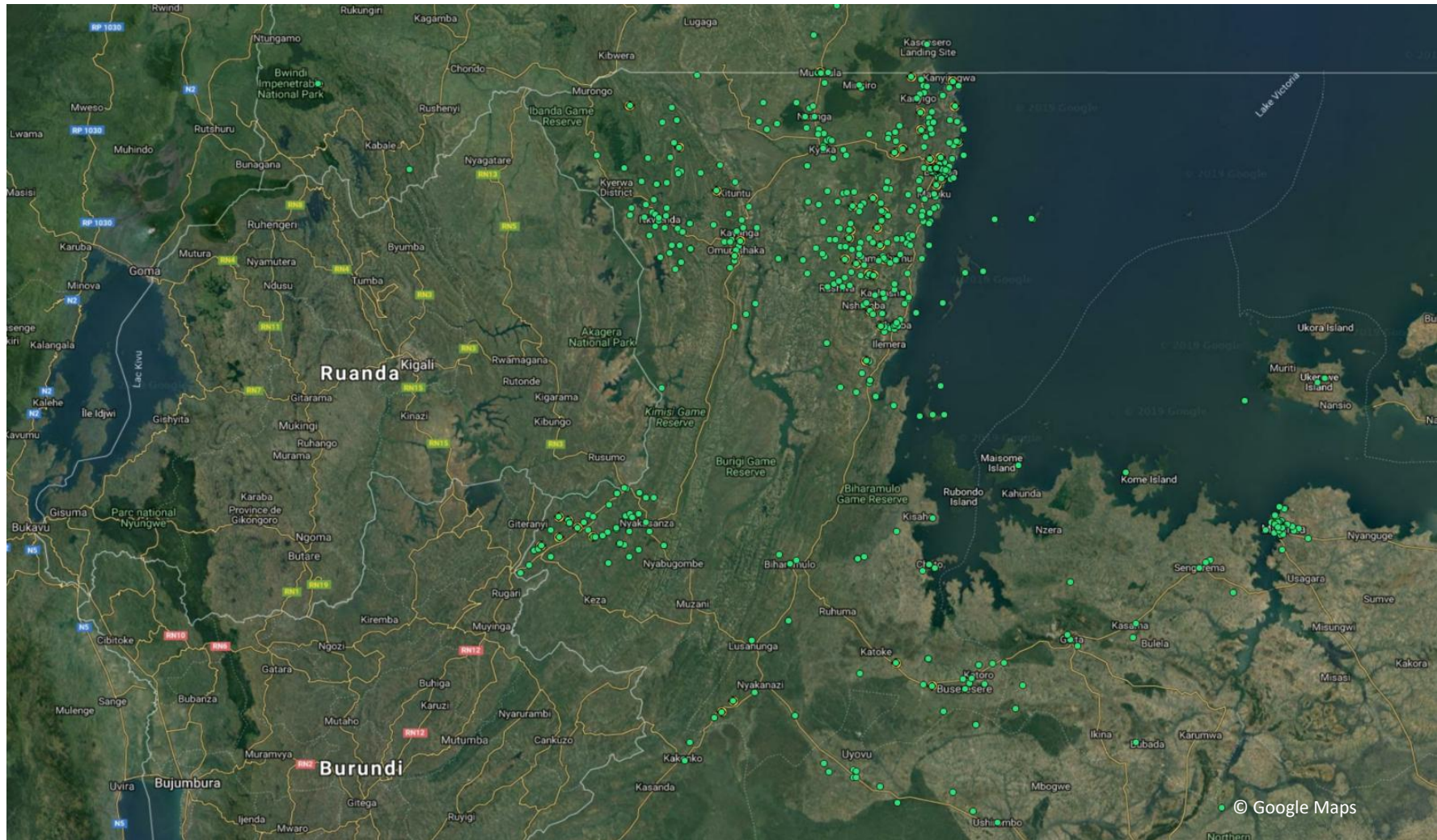
- Tracking Survey: 816 households (~5000 individuals) from 51 clusters
- Followed over the 20-year time period

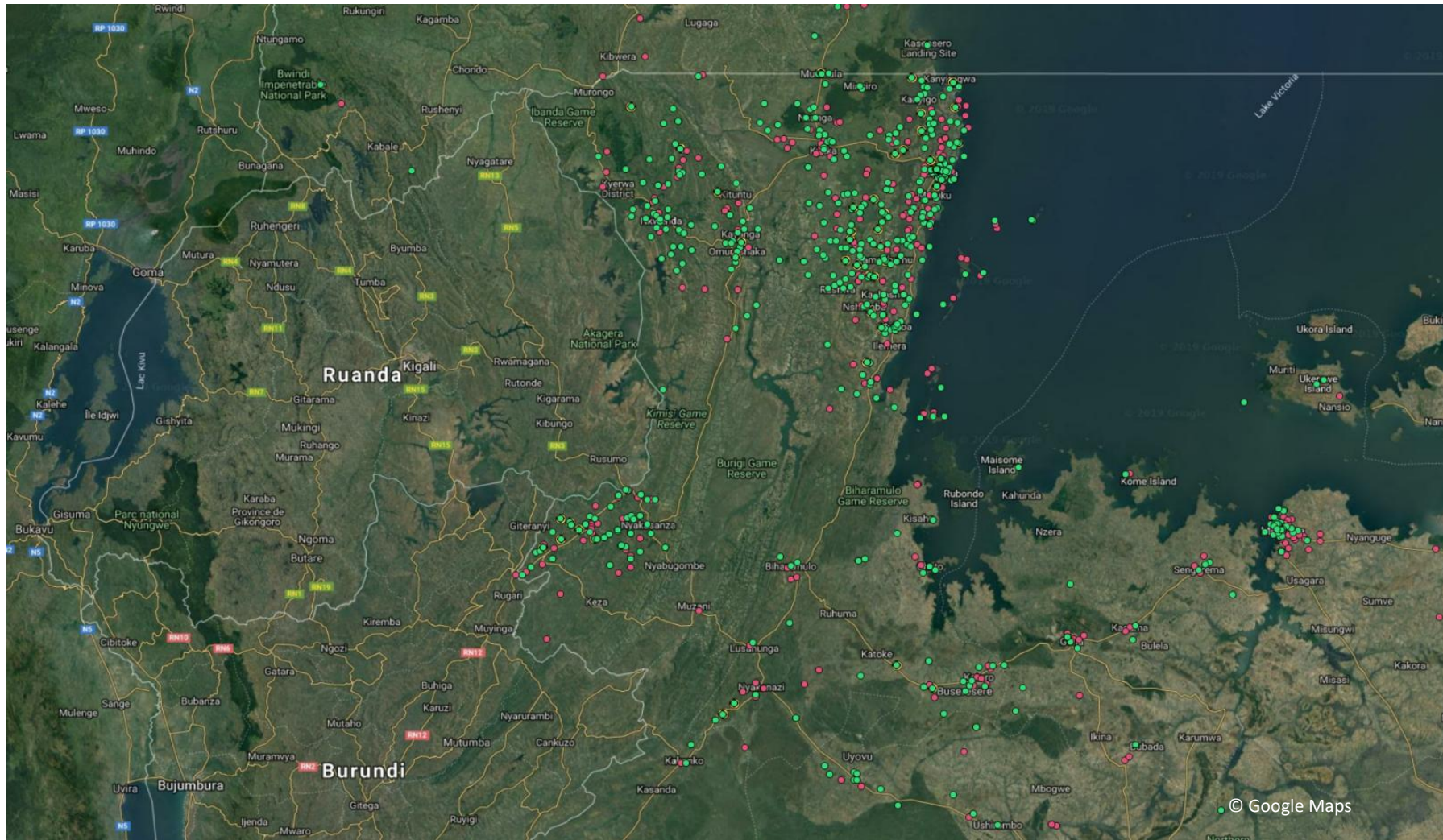
---

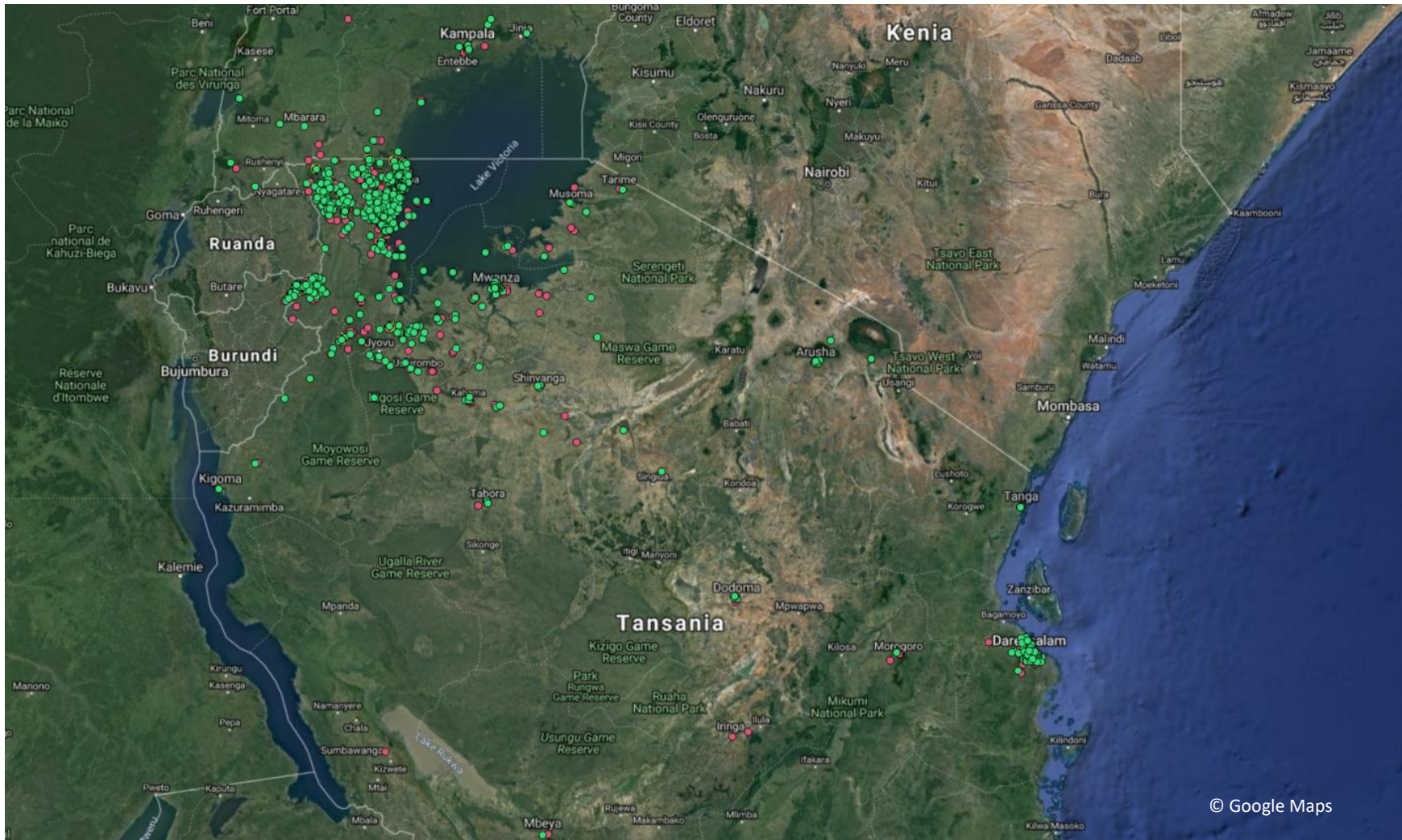
# The data: KHDS

- Geolocalized households in 1991, 2004, 2010
- 2004, 2010: Retrospective information on migration for first and last move (How often? In which years? Why? Where?)
- Generated retrospective panel data for econometric analysis
- Balanced panel: 3509 individuals



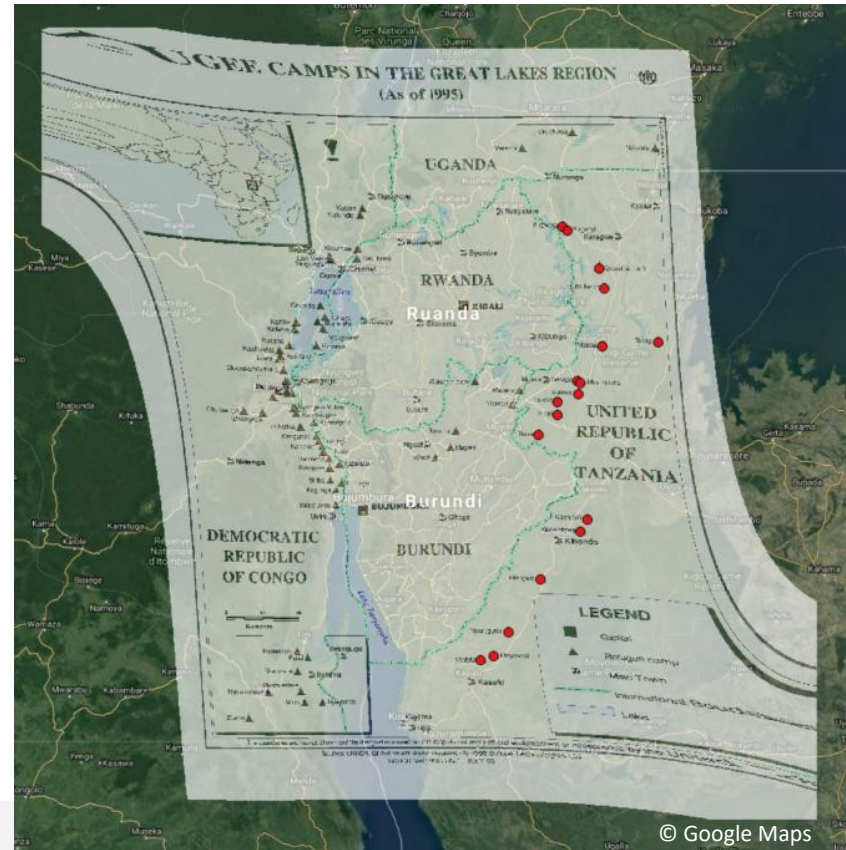


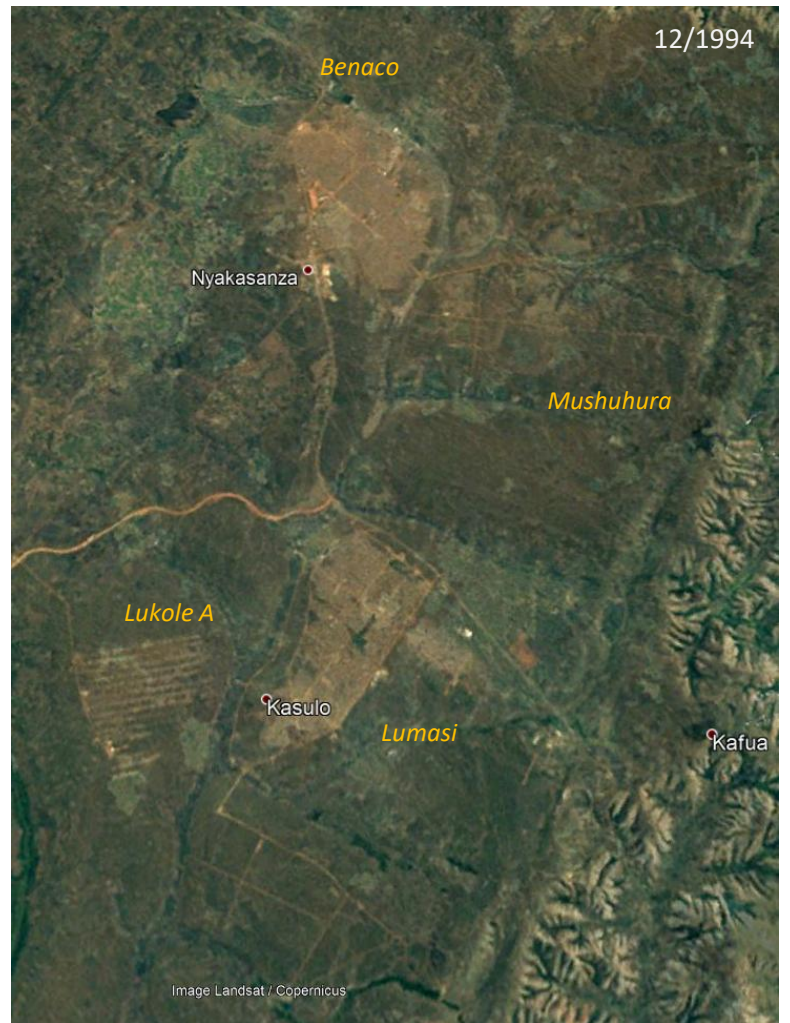


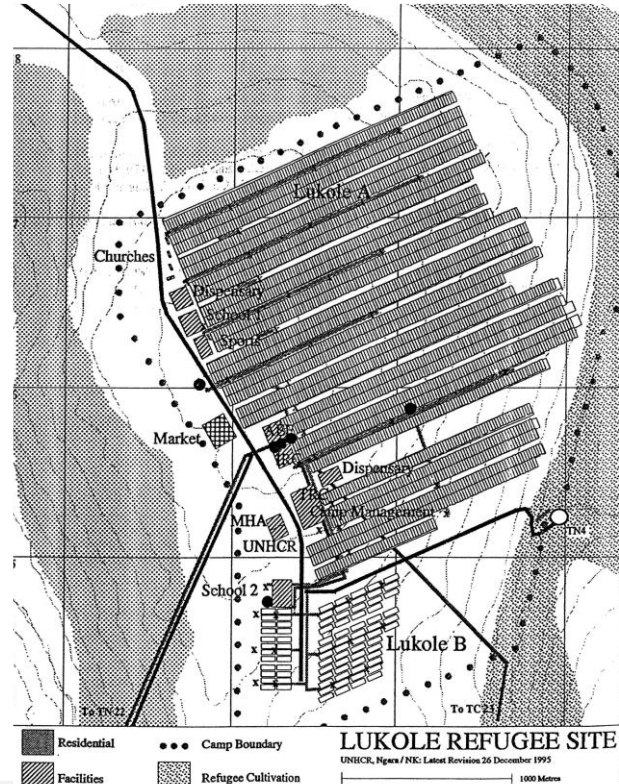
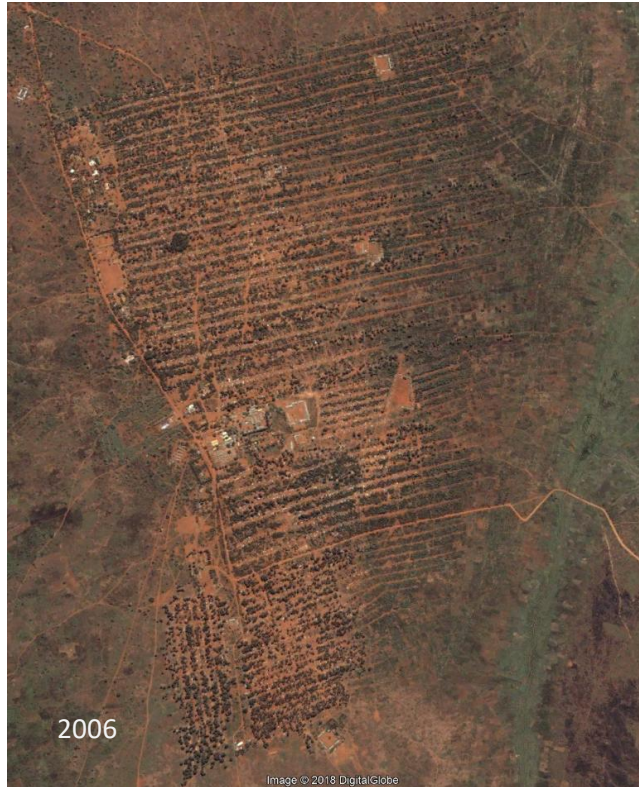


# The data: Refugee camps

Georeferenced  
UNHCR Map  
„Refugee camps in  
the Great Lakes  
Region“  
(*UNHCR Global  
Insight Digital  
Mapping, 1998*)





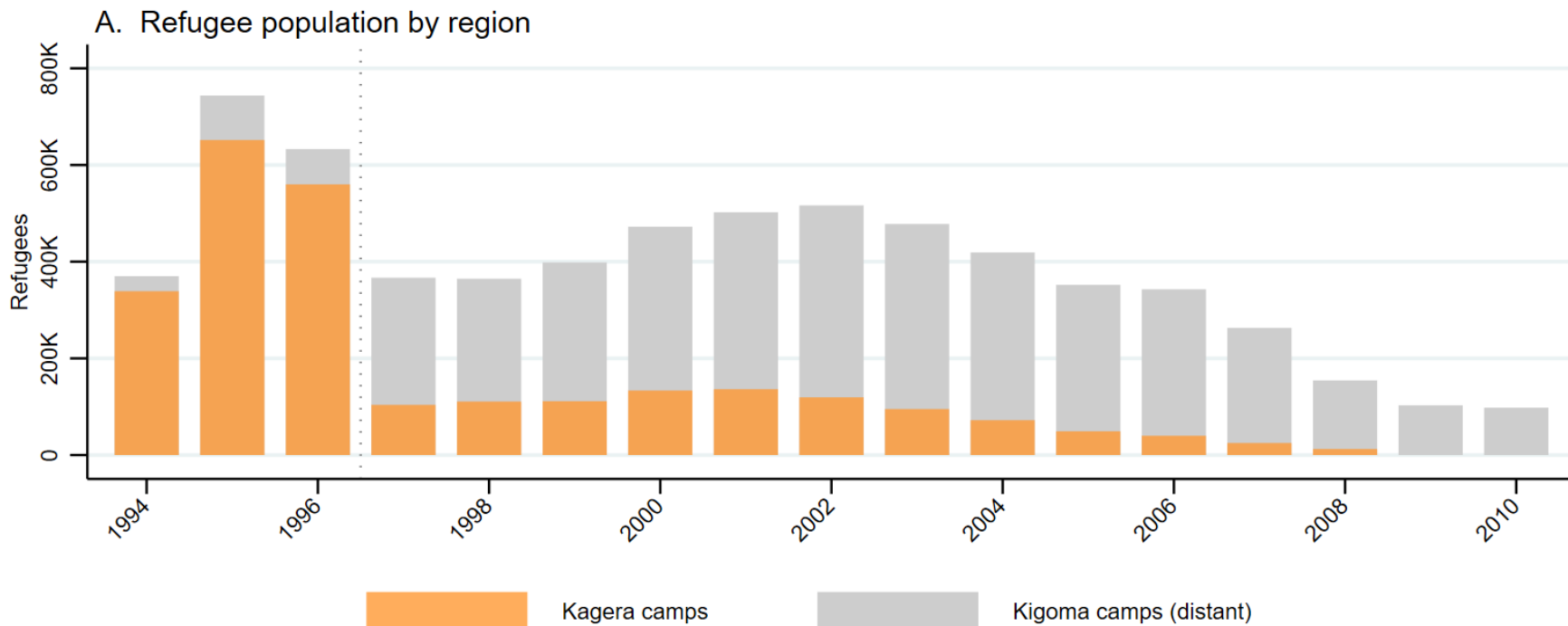


Using current high-resolution satellite images (not available for the 1990s)

- Confirm whether the „brown areas“ in low-resolution images of the 1990s were indeed camps
- Match them to UNHCR camp maps

(Source: Werkhoven 1997)

## Refugee presence, exposure, and host population migration Kagera, Tanzania 1991-2010

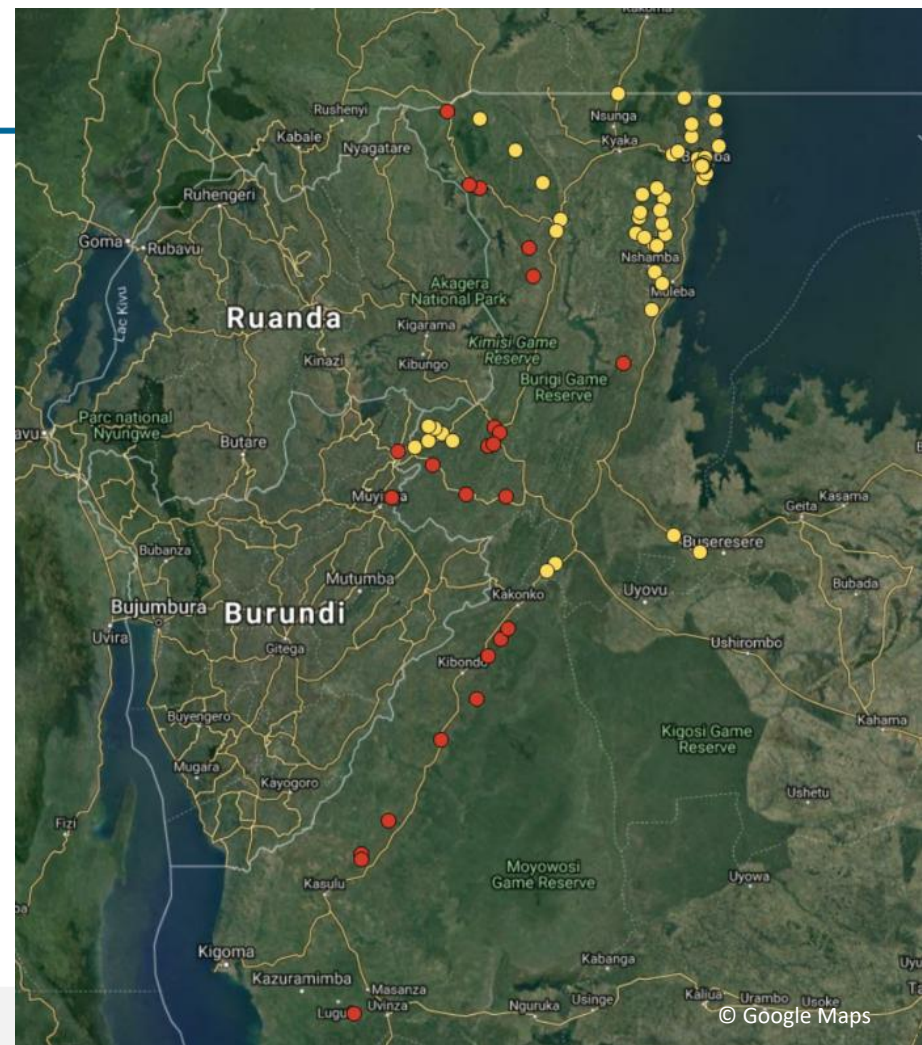


- Refugee Camps
- Clusters (KHDS)

→ Obtain euclidian distance matrix with distances from each individual to each camp  
(51 clusters; 24 camps)

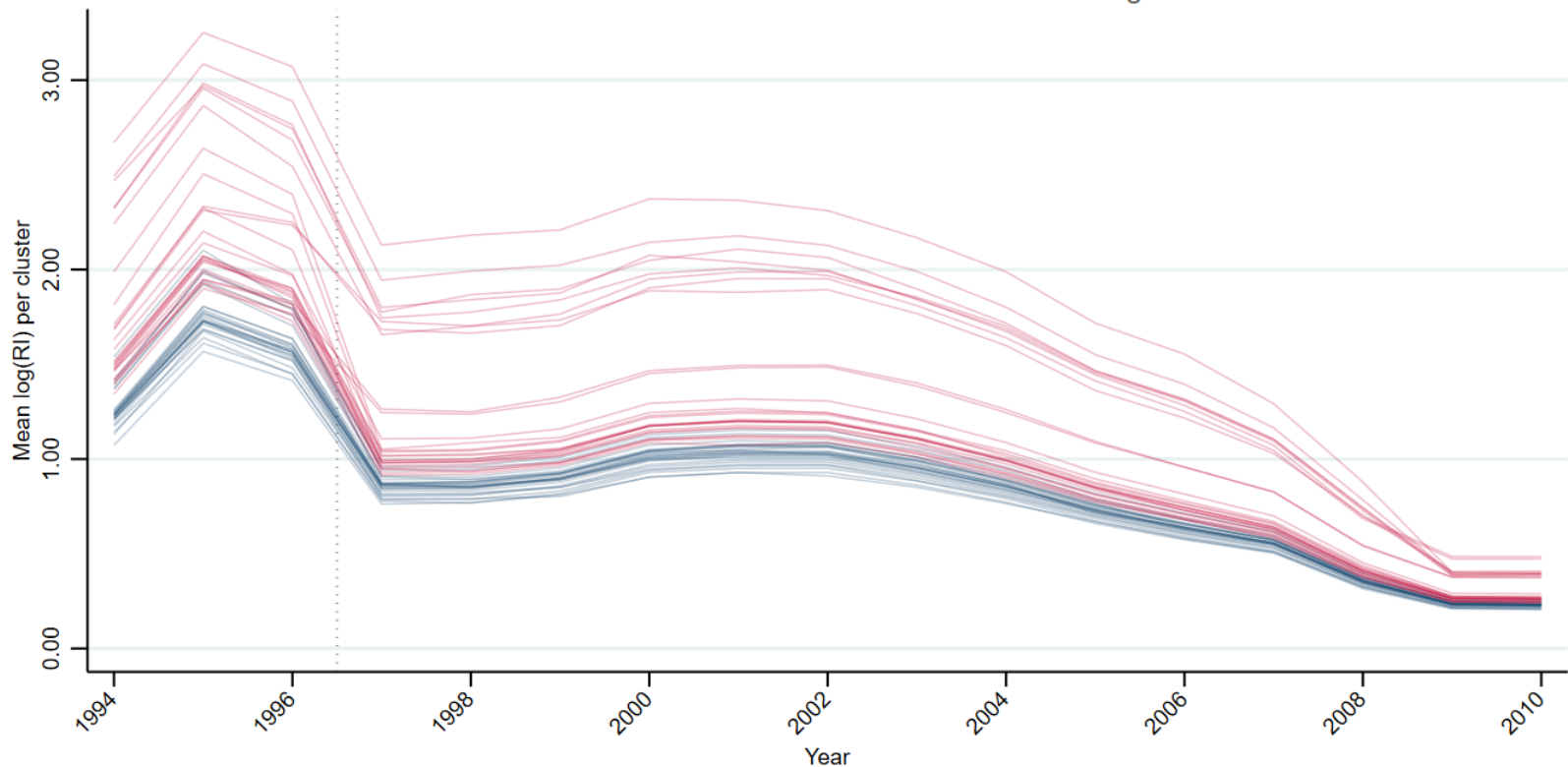
$$RI_{i,v,t} = \sum_{c=1}^{24} \frac{pop_{c,t}}{d_{i,c,t}}$$

→ Distance-weighted refugee exposure



# Cluster-level RI trajectories (1994-2010)

Within-cluster variation over time identifies the main regression

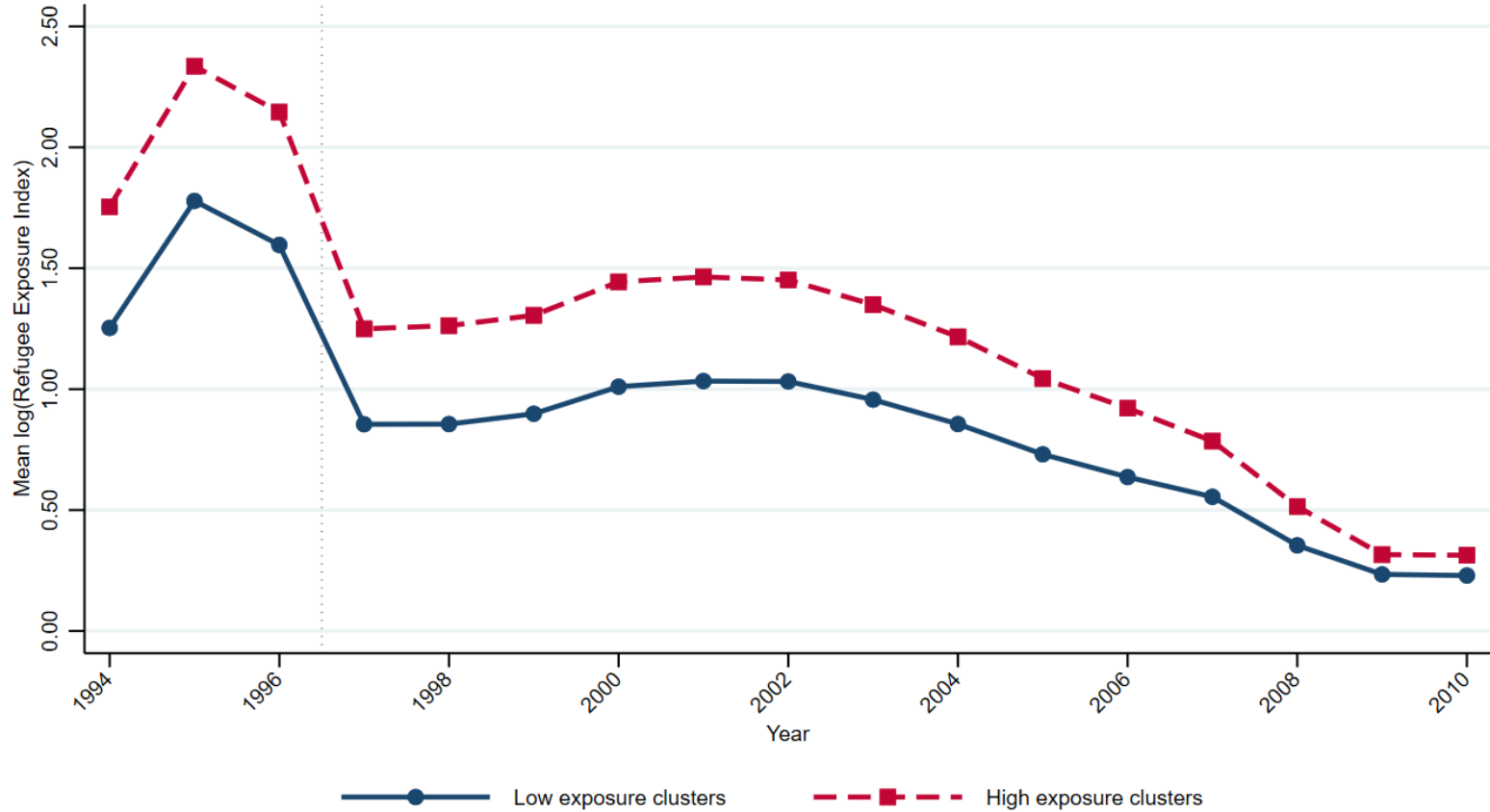


— Low exposure clusters (below median)

— High exposure clusters (above median)

Each line = one cluster (51 total). Dotted line: Rwandan repatriation (December 1996).

### Refugee Exposure Index over time by cluster group



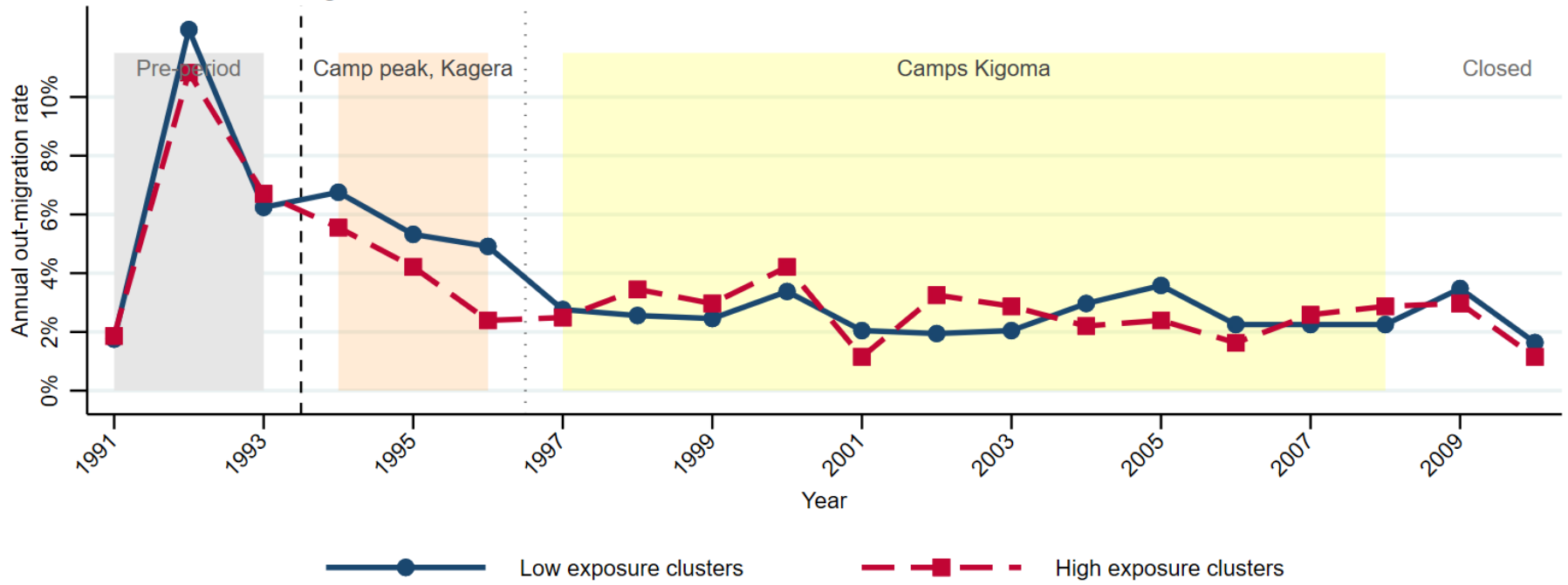
Dotted line: Rwandan repatriation (December 1996).

# Descriptive Statistics

Table 1: Summary statistics at baseline (1994) by Refugee exposure of clusters

|                               | Low-treatment | High-treatment | P-val    | Low-treatm.-obs. | High-treatm.-obs. |
|-------------------------------|---------------|----------------|----------|------------------|-------------------|
| Gender (0: female 1: male)    | 0.485         | 0.481          | 0.792    | 1705             | 1804              |
| Year of birth                 | 1973.409      | 1972.813       | 0.288    | 1705             | 1804              |
| Household size                | 9.712         | 9.492          | 0.166    | 1705             | 1804              |
| Empl. stat.: Employed         | 0.153         | 0.139          | 0.311    | 1324             | 1397              |
| Empl. stat.: Agricult. worker | 0.893         | 0.912          | 0.093*   | 1325             | 1397              |
| Empl. stat.: Self-employed    | 0.205         | 0.176          | 0.051*   | 1324             | 1397              |
| Literacy                      | 0.733         | 0.609          | 0.000*** | 1325             | 1398              |
| Years of schooling            | 4.157         | 3.332          | 0.000*** | 1321             | 1387              |
| Income per capita             | 26181.595     | 16471.653      | 0.000*** | 1705             | 1804              |
| Assets per capita             | 220451.651    | 118585.859     | 0.000*** | 1705             | 1804              |
| Migrated 1991-1993            | 0.063         | 0.060          | 0.669    | 1705             | 1804              |
| Migrated 1994-2010            | 0.491         | 0.463          | 0.096*   | 1705             | 1804              |
| Avg. Refugee Index, cluster   | 1.688         | 3.327          | 0.000*** | 1705             | 1804              |
| Observations                  | 3509          |                |          |                  |                   |

C. Annual out-migration rate



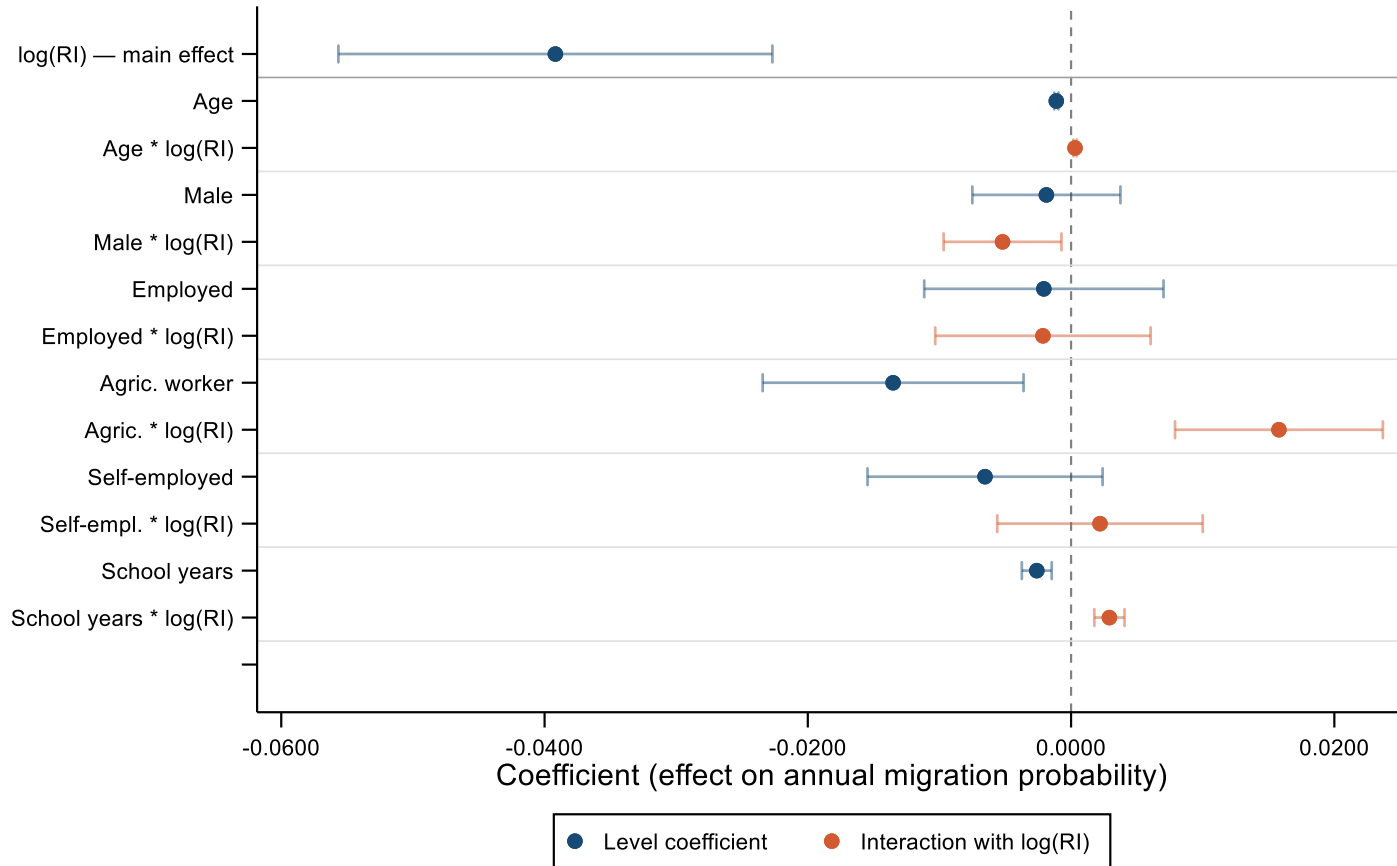
# Regression Analysis

$$Mig_{i,c,t} = \beta_1 RI_{i,c,t} + \beta_2 X_{i,c,1993} + \beta_3 RI_{i,c,t} * X_{i,1993} + \gamma_t + \delta_c + \epsilon_{i,t}$$

|              |  |
|--------------|--|
| $Mig_{i,t}$  | Migration Dummy  |
| $Ri_{i,t}$   | Refugee Exposure Index, log  |
| $X_{i,1993}$ | Individual baseline controls (gender, age, schooling, employment, income, wealth...) |
| $\gamma_t$   | Time fixed effects   |
| $\delta_c$   | Cluster fixed effects  |

# Refugee exposure and migration: level and interaction effects

Interactions model | 95% CI | cluster + year FE | full sample 1994--2010



Indented rows: interaction of variable with log(RI).

Controls not shown: HH size, log(income p.c.), log(assets p.c.) and their interactions.

# Regression Analysis

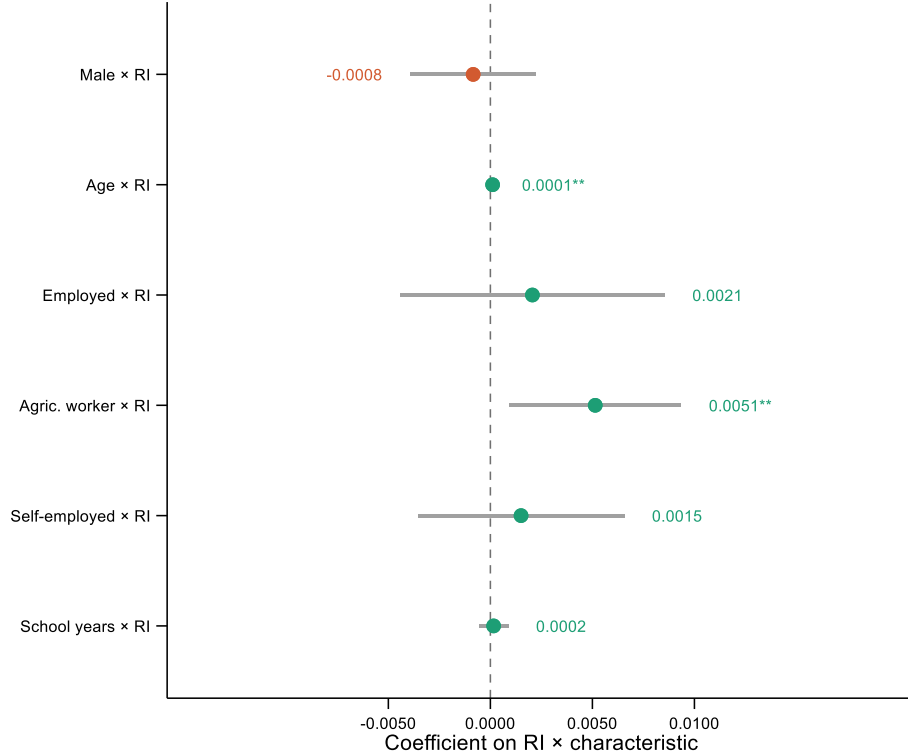
$$Mig\_towards_{i,c,t} = \beta_1 RI_{i,c,t} + \beta_2 X_{i,c,1993} + \beta_3 RI_{i,c,t} * X_{i,1993} + \gamma_t + \delta_c + \epsilon_{i,t}$$

$$Mig\_away_{i,c,t} = \beta_1 RI_{i,c,t} + \beta_2 X_{i,c,1993} + \beta_3 RI_{i,c,t} * X_{i,1993} + \gamma_t + \delta_c + \epsilon_{i,t}$$

# Who moves toward vs. away from camps when refugee presence increases?

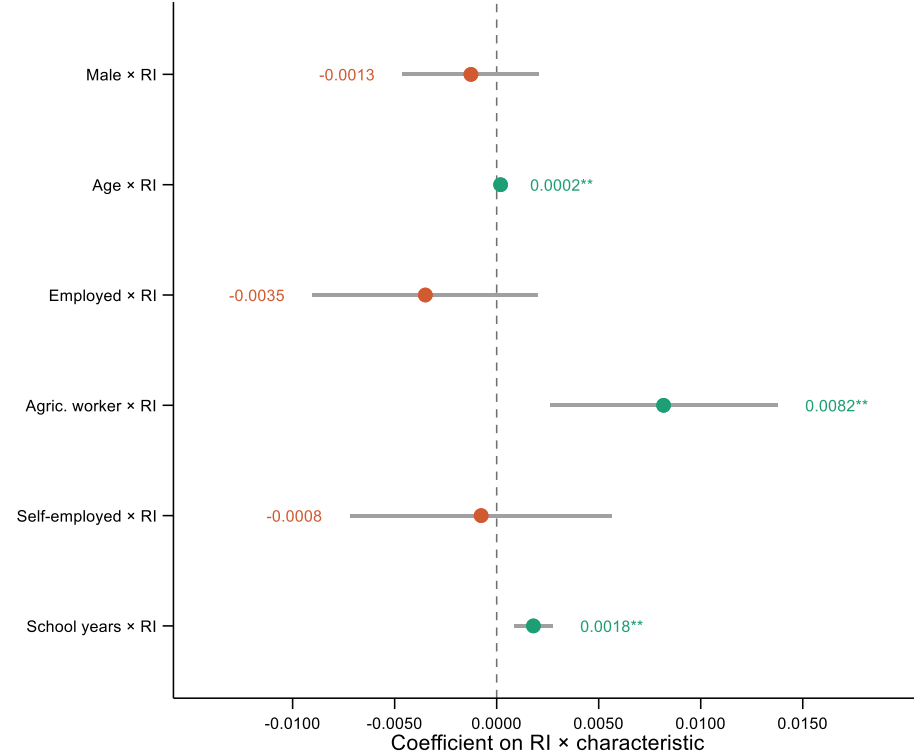
## A. Amplification of movement toward camps

RI × X coefficients | 95% CI | cluster + year FE



## B. Amplification of movement away from camps

RI × X coefficients | 95% CI | cluster + year FE



RI × X coefficient: additional tendency to move in that direction when log(RI) is high.  
Teal = positive (amplified movement in that direction). Orange = negative (dampened).  
Both panels: cluster + year FE, full sample 1994--2010. 95% CI. \*\* p<0.05, \* p<0.10.  
Controls: sex, age, HH size, employment, schooling, log(income p.c.), log(assets p.c.).

## Heterogeneity

Age heterogeneity

Schooling heterogeneity

Camp phase decomposition

## Placebo tests

Kagera/ Kigoma camps

Leads

# Conclusion

- Refugee presence suppresses out-migration - doubling exposure reduces migration by ~ 1.7 p.p.
  - Effect driven by young people — children and young adults (0–29) stay; older groups unaffected
  - Educated individuals move away from camps — consistent with local brain drain
  - Agricultural workers become more mobile overall — camps disrupt labor markets rather than push or pull cleanly
  - Placebo: distant Kigoma camps generate no response; leads test confirms no anticipation
  - Outlook: Gravity-model with grid-cell refugee exposure & night lights to match migration
- Retrospective survey questions as cost-effective tool in migration research

Thank you!

Anna Gasten  
anna.gasten@uni-goettingen.de

---

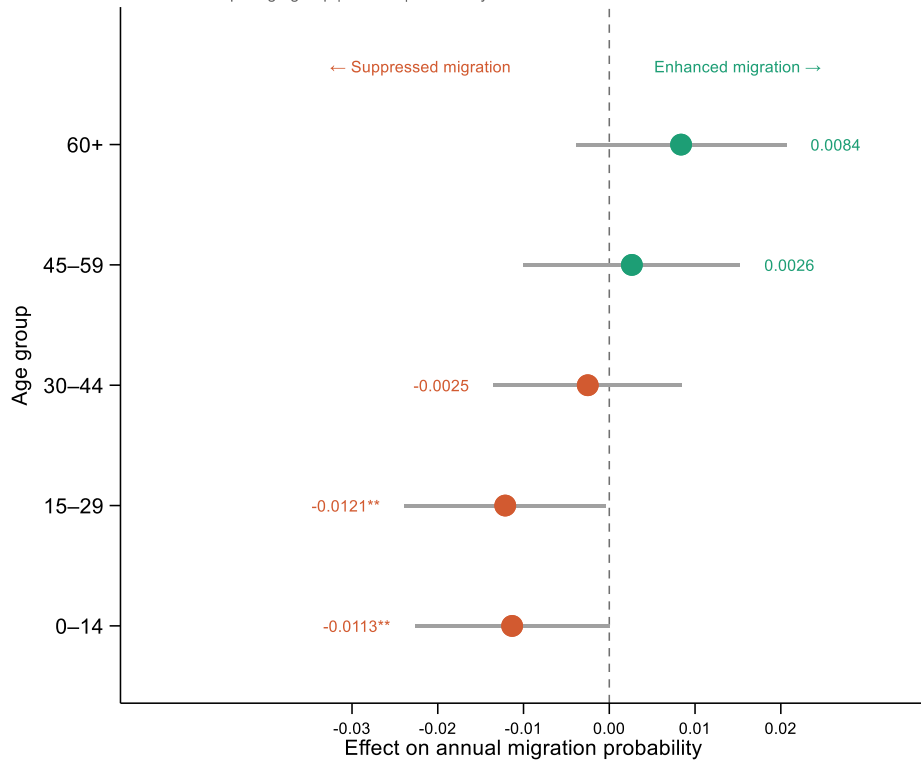
# Annex

Heterogeneities  
Robustness

# Refugee camps reshape the age structure of host communities

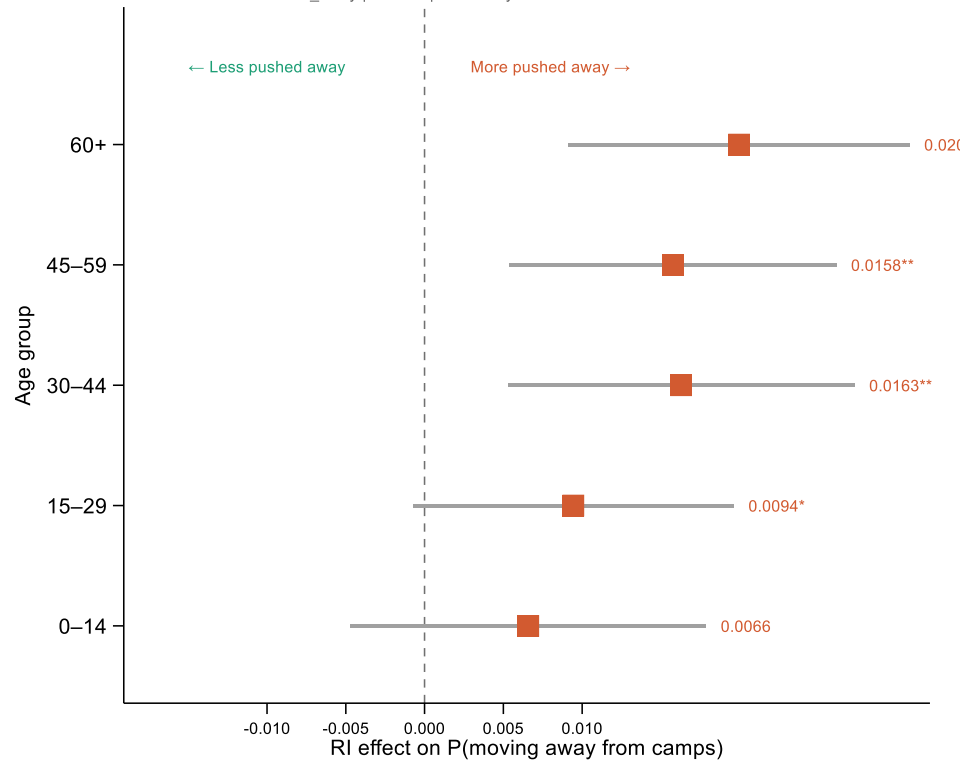
## A. Effect of refugee exposure on migration

Total RI effect per age group | 95% CI | cluster + year FE



## B. Does high RI push each age group away from camps?

Total RI effect on moved\_away | 95% CI | cluster + year FE



Panel A: total RI effect on annual migration probability by age group.

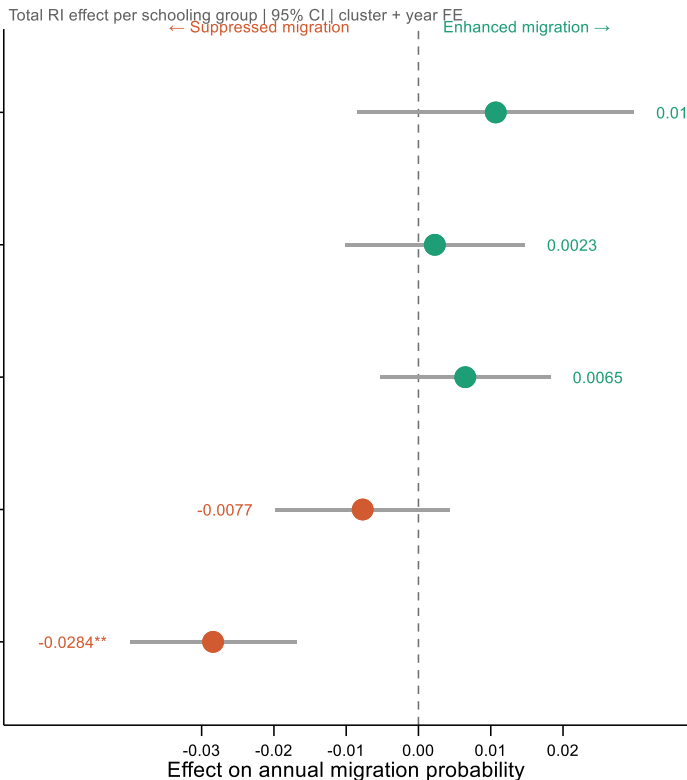
Panel B: total RI effect on probability of moving away from camps by age group.

Both panels: cluster + year FEs, full sample 1994--2010. 95% CI.

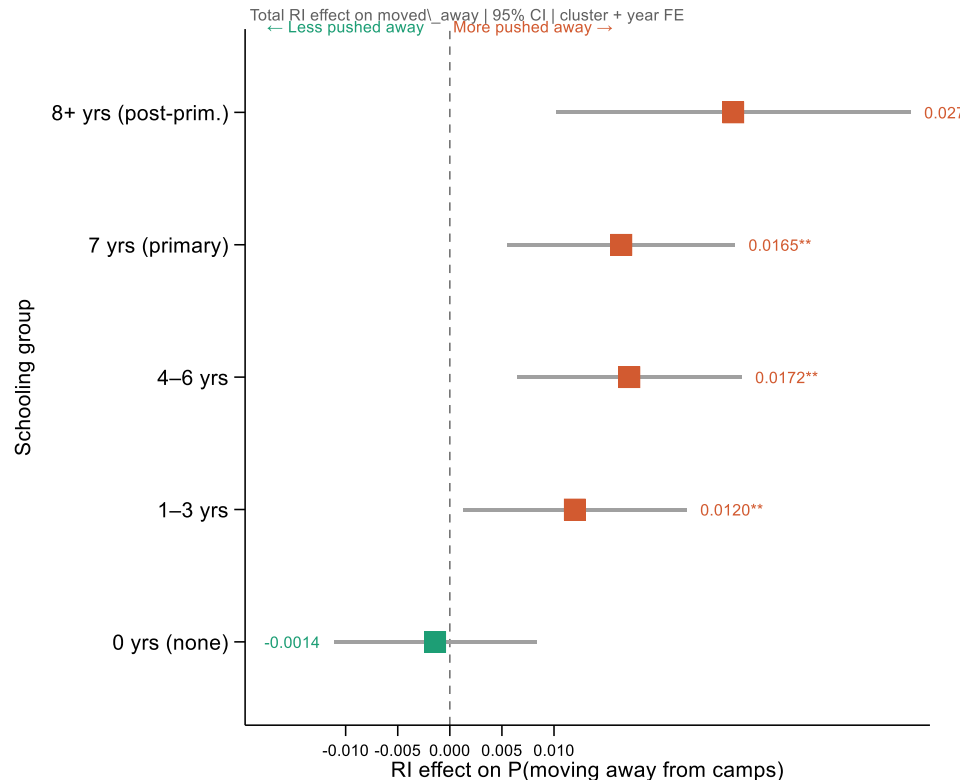
Base category: children aged 0--14. \*\* p<0.05, \* p<0.10.

# Refugee camps and migration: heterogeneity by schooling

## A. Effect of refugee exposure on migration



## B. Does high RI push each schooling group away from camps?



Panel A: total RI effect on annual migration probability by schooling group (lincom).  
 Panel B: total RI effect on probability of moving away from camps by schooling group.  
 Both panels: cluster + year FE, full sample 1994--2010, 95% CI.  
 Base category: 0 years of schooling. \*\* p<0.05, \* p<0.10.

**Table 8:** Camp phase decomposition: Tanzania refugee exposure index

|                                   | (1)<br>All Tanzania camps |
|-----------------------------------|---------------------------|
| Log RI, Phase 1 (1994–1996, base) | -0.0242**<br>(0.0092)     |
| Log RI × Phase 2 (1997–2003)      | 0.0176<br>(0.0109)        |
| Log RI × Phase 3 (2004–2010)      | 0.0182<br>(0.0132)        |
| Year FE                           | Yes                       |
| Cluster FE                        | Yes                       |
| Controls                          | Yes                       |
| Observations                      | 3.1e+04                   |

Standard errors in parentheses

Phase 2 and 3 coefficients: incremental change relative to Phase 1.

Total RI effect per phase (lincom):

Phase 1 (1994-1996): -0.0242\*\*\* (0.0092)

Phase 2 (1997-2003): -0.0067 (0.0078)

Phase 3 (2004-2010): -0.0060 (0.0122)

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 9:** Refugee exposure and host community migration: Kagera vs. Kigoma

|  | (1)<br>Baseline        | (2)<br>+ Interactions  |
|--|------------------------|------------------------|
| Log RI — Kagera camps (nearby)             | -0.0240***<br>(0.0066) | -0.0414***<br>(0.0077) |
| Log RI — Kigoma camps (distant, 200–400km) | 0.0207*<br>(0.0118)    | 0.0078<br>(0.0123)     |
| RI × characteristics                       | No                     | Yes                    |
| Year FE                                    | Yes                    | Yes                    |
| Cluster FE                                 | Yes                    | Yes                    |
| Observations                               | 59,638                 | 59,638                 |

Standard errors in parentheses

Standard errors clustered at the cluster level.

Full sample 1994–2010. Zero-imputed on employment and schooling.

Kagera and Kigoma RIs estimated simultaneously in the same regression.

Kigoma RI =  $\log(1 + \text{Tanzania RI} - \text{Kagera RI})$ : camps 200–400km away.

Col (2): both Kagera and Kigoma RIs interacted with sex, age, employment, schooling. Interaction terms included in model but suppressed from table.

Placebo logic: if Kigoma coefficient remains zero after interactions, the effect is geographically specific to nearby Kagera camps.

Additional controls: HH size,  $\log(\text{income p.c.})$ ,  $\log(\text{assets p.c.})$ .

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 10:** Placebo test: contemporaneous vs. lead refugee exposure

|              | (1)<br>Contemp. RI    | (2)<br>1-year lead  | (3)<br>2-year lead  |
|--------------|-----------------------|---------------------|---------------------|
| Log(RI), t   | -0.0125**<br>(0.0055) |                     |                     |
| Log(RI), t+1 |                       | -0.0038<br>(0.0042) |                     |
| Log(RI), t+2 |                       |                     | -0.0074<br>(0.0047) |
| Observations | 59,638                | 59,587              | 59,536              |

Standard errors in parentheses

Standard errors clustered at the cluster level.

Cluster and year fixed effects in all columns.

Controls: sex, age, household size, employment status (6-month recall), years of schooling, log income p.c., log assets p.c.

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

# Sources

- Alix-Garcia, J., & Saah, D. (2009). *The effect of refugee inflows on host communities: Evidence from Tanzania*. *The World Bank Economic Review*, 24, 148–170.
- Alix-Garcia, J., Walker, S., Bartlett, A., Onder, H., & Sanghi, A. (2018). *Do refugee camps help or hurt hosts? The case of Kakuma, Kenya*. *Journal of Development Economics*, 130, 66-83.
- Baez, Javier E. (2011), “Civil wars beyond their borders: The human capital and health consequences of hosting refugees,” *Journal of Development Economics*, 2011, 96 (2), 391–408
- Barman, B.C., 2020. *Impact of refugees on host developing countries*. In *Refugee crises and third-world economies: Policies and perspectives* (pp. 103-111). Emerald Publishing Limited.
- Gnowa, J.G., Verschuur, J. and Comes, T., 2026. *Resilient infrastructure planning in refugee and internally displaced person settlements: A systematic review of scholarly and grey literature*. *Progress in Disaster Science*, p.100575.
- Luecke, M. and Schneiderheinze, C., 2017. *More financial burden-sharing for developing countries that host refugees*. *Economics: The Open-Access, Open-Assessment E-Journal*, 11(2017-24), pp.1-11.
- Maystadt, J. F., & Verwimp, P. (2014). *Winners and losers among a refugee-hosting population*. *Economic development and cultural change*, 62(4), 769-809.
- Ruiz, I., & Vargas-Silva, C. (2016). “The labour market consequences of hosting refugees,” *Journal of Economic Geography*, 2016,16 (3), 667–694.
- Salemi, C., 2021. *Refugee camps and deforestation in Sub-Saharan Africa*. *Journal of Development Economics*, 152, p.102682.
- UNHCR (2005). *Identifying Gaps in Protection Capacity. Tanzania* (available at <https://www.refworld.org/docid/472896f50.html>, accessed on 11.06.2018)
- UNHCR (2019). *Global Trends. Forced Displacement in 2018* (available at <https://www.unhcr.org/globaltrends2018/>, accessed on 20.06.2019)
- UNHCR *Global Insight Digital Mapping* (1998). *Refugee Camps in the Great Lakes Region as of 1995* (available at <https://www.unhcr.org/afr/3ae6baf210.pdf>, accessed on 20.10.2018)
- Verme, P. and Schuettler, K., 2021. *The impact of forced displacement on host communities: A review of the empirical literature in economics*. *Journal of Development Economics*, 150, p.102606.
- Werkhoven, W. (1997). „Mapping the effects and impacts of refugee sites. The case of the 1994-1996 influxes in the Kagera region, Tanzania“, Master Thesis, University of Eindhoven