

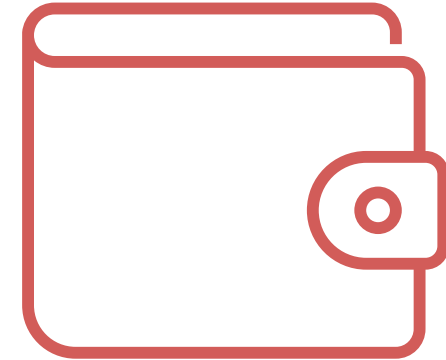
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# Empty digital wallets: new technologies and old inequalities in digital financial services among women

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June 2022



# Motivation



Digital financial services (DFS) have potential to reach previously “unbanked” consumers.

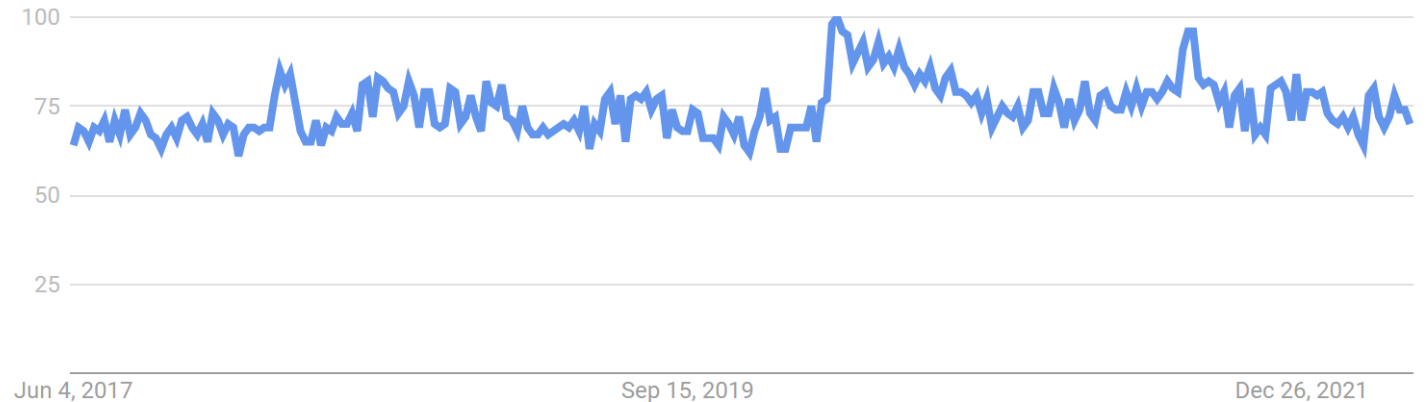


Digital payments, especially on mobile phones, are even more important during the pandemic.

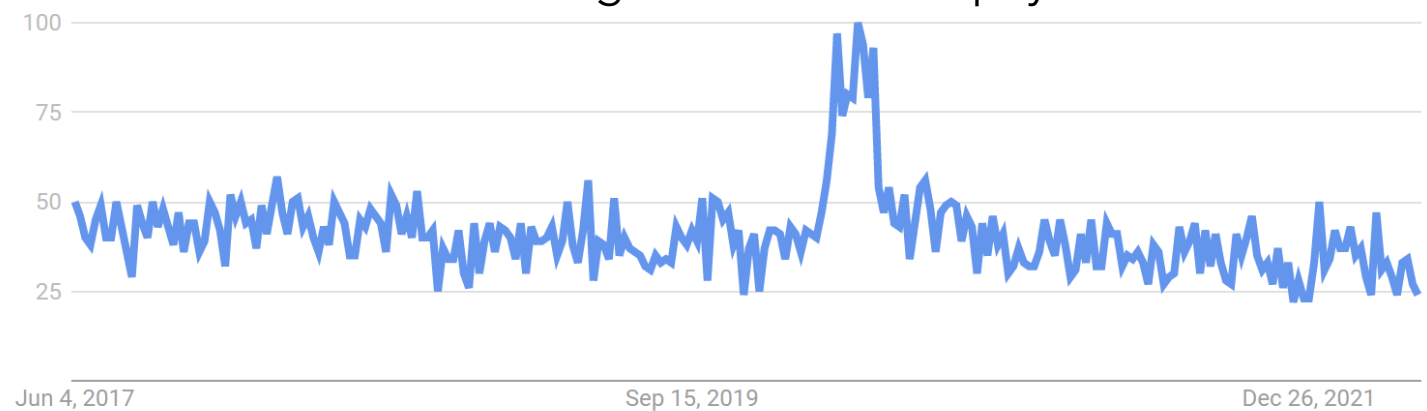


Access to these services is especially important for women.

Worldwide Google searches for “mobile money”



Worldwide Google searches for “pay bills online”



# This research

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01

How unequal is access to and use of digital financial services (DFS) among women?

02

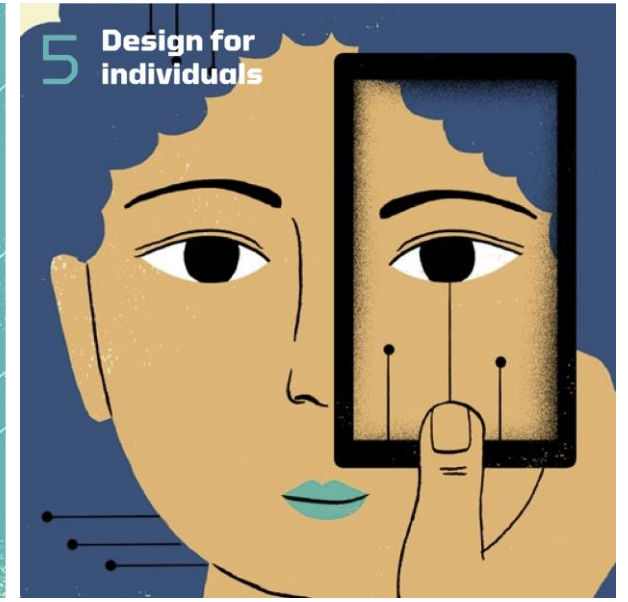
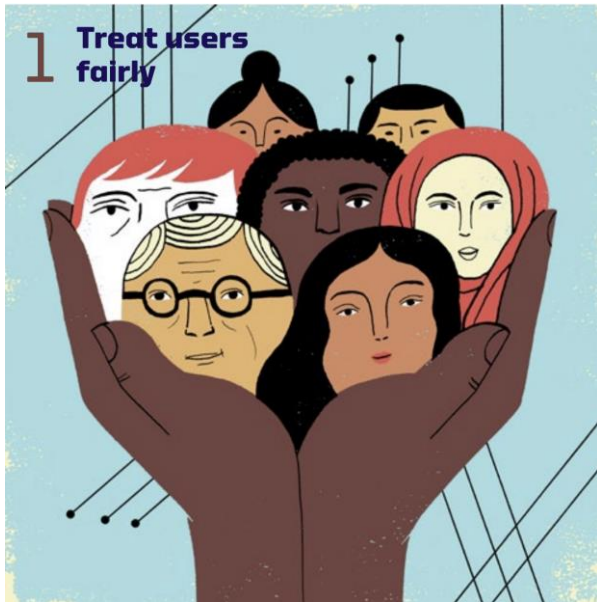
How does the physical and educational infrastructure for DFS reduce or reinforce these inequalities?

03

Are DFS likely to reach those excluded by traditional finance?

# Motivation

UN Principles for Responsible Digital Payments underscore the importance of studying inequalities in DFS for women



Building fairness into DFS systems includes infrastructure, affordability, and education

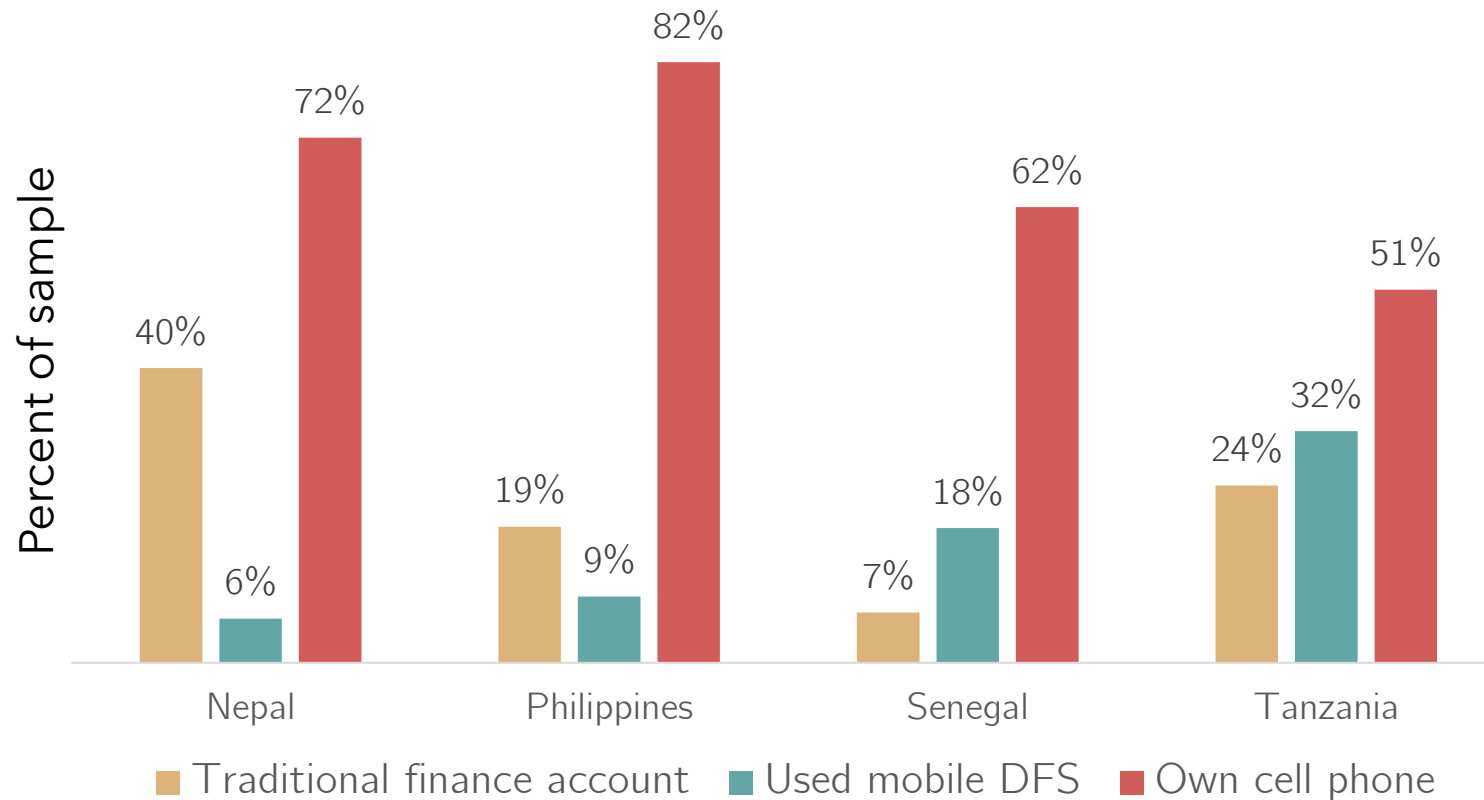
Funds are only accessible when network quality is reliable and cash-in-cash-out points are available

Women face specific needs and challenges around DFS and need particular attention

Underserved communities may face challenges to quality networks and infrastructures

# Scope of this study

Patterns of women's DFS use in four countries with different contexts



# Data

## Demographic and Health Surveys (DHS) Round VII (2016)

- Cross-country comparable
- Detailed information on household and individual characteristics

## Link to other datasets

- Geolocation on a cluster level
- Displaced up to 10km for privacy

## Questions on financial patterns

- Do you have an account in a bank or other financial institution that you yourself use?
- Do you use your mobile phone for any financial transactions?

# Data

DHS geolocations allow for linking to other datasets



**OpenCellID**

Locations of  
mobile phone  
towers



**OpenStreetMap**

Locations of  
banks



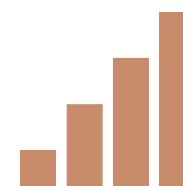
**Gridded  
Population  
of the World**

Population  
density



**Nighttime  
lights**

Used to  
approximate  
incomes or  
economic  
activity



**Ookla Global  
Mobile Network  
Performance  
Maps**

Mobile network  
download  
speeds,  
geolocated

# Methods

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1

Correlations and spatial Gini coefficient

- Understanding concentration and inequality across space

2

Cluster-level regressions

- Understanding the inequalities between clusters and how infrastructure matters

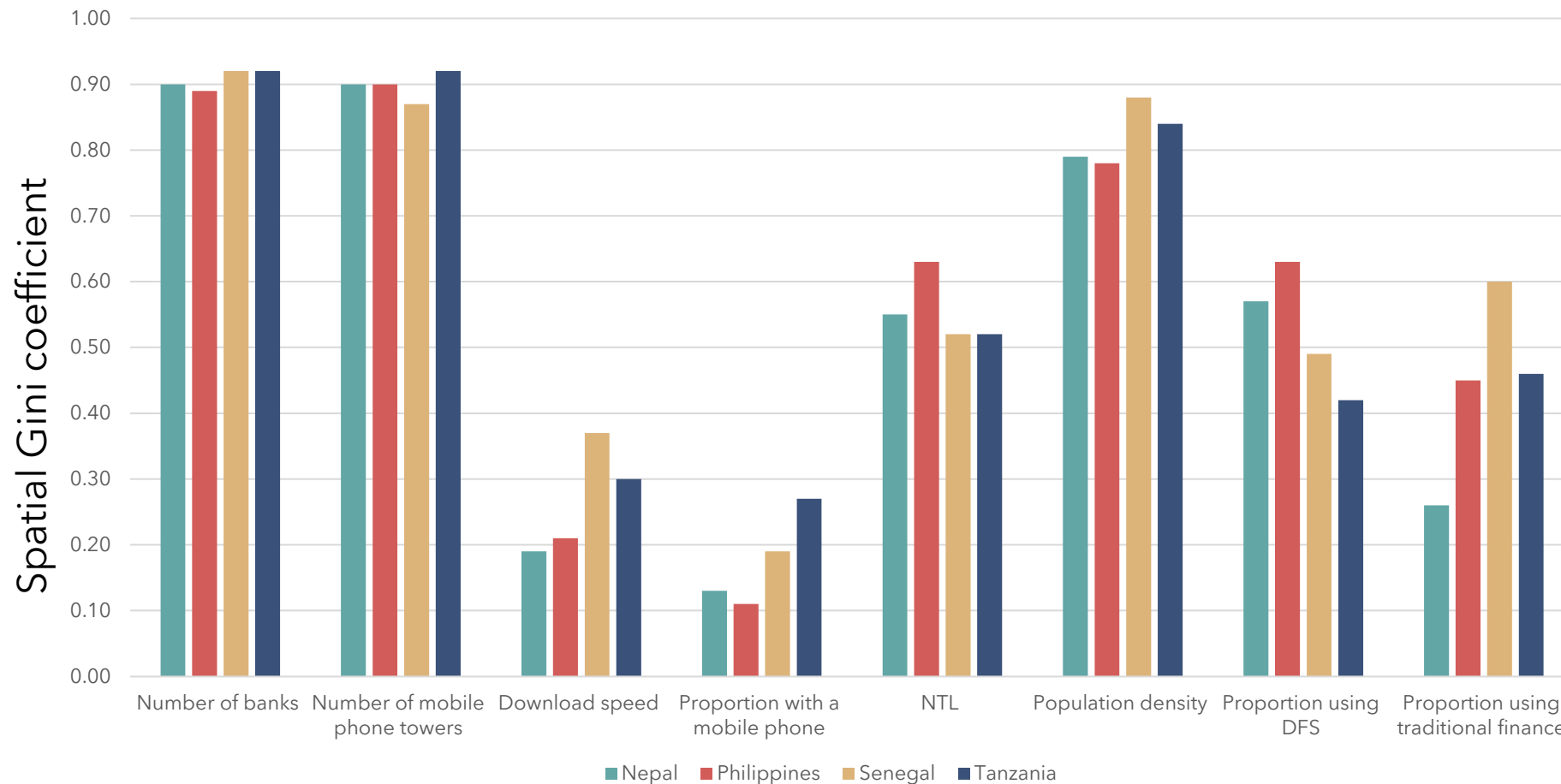
3

Individual-level regressions

- Understanding the inequalities between people and how characteristics matter

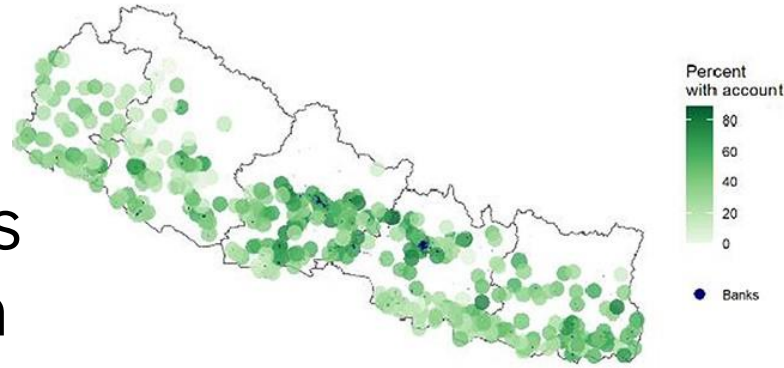


# Infrastructure and access to finance are highly concentrated in space

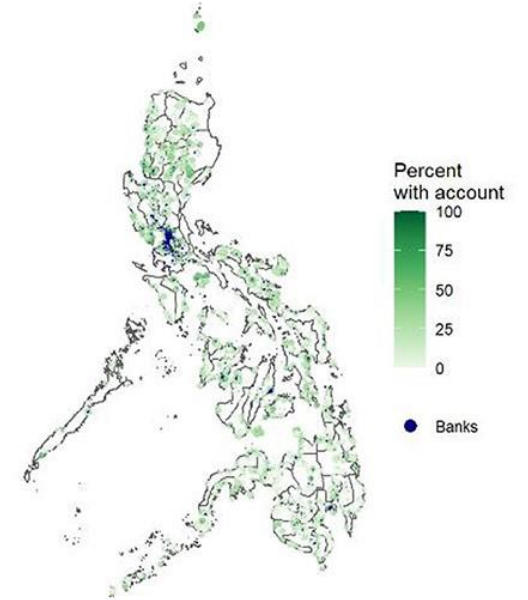


Traditional finance is highly unequal, with account ownership concentrated in the same place as banks

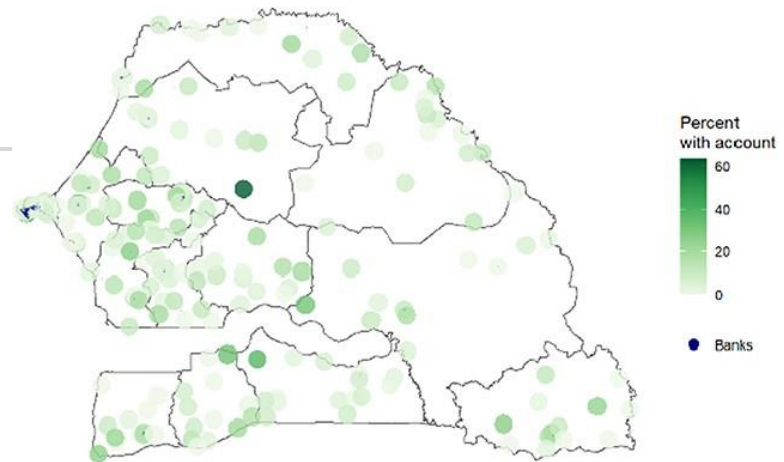
Nepal



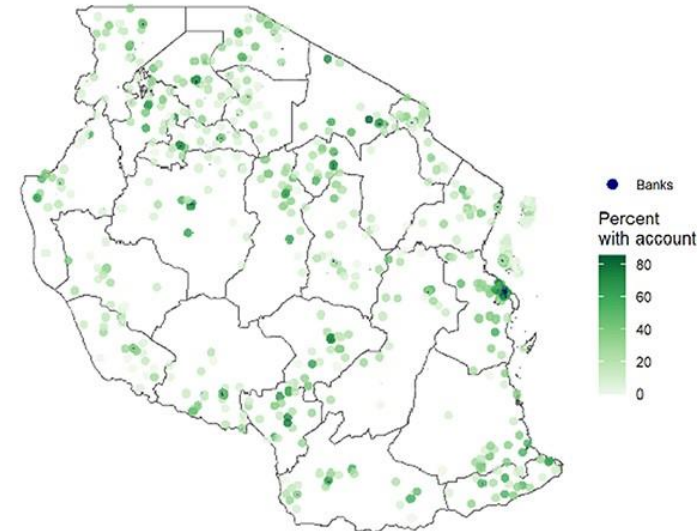
Philippines



Senegal

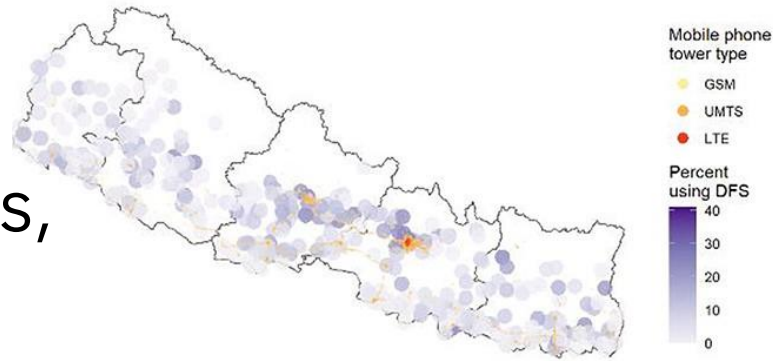


Tanzania

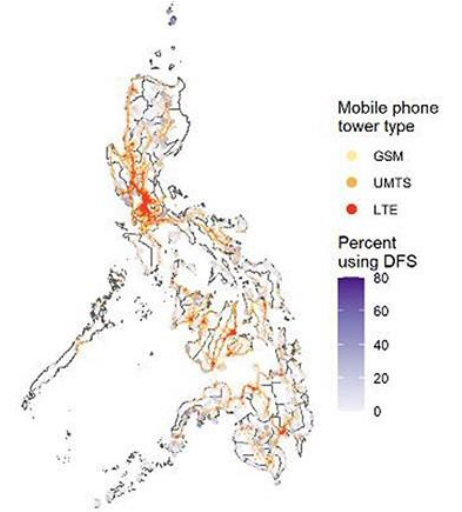


Mobile phone towers, especially high-quality LTE towers, are correlated with DFS use.

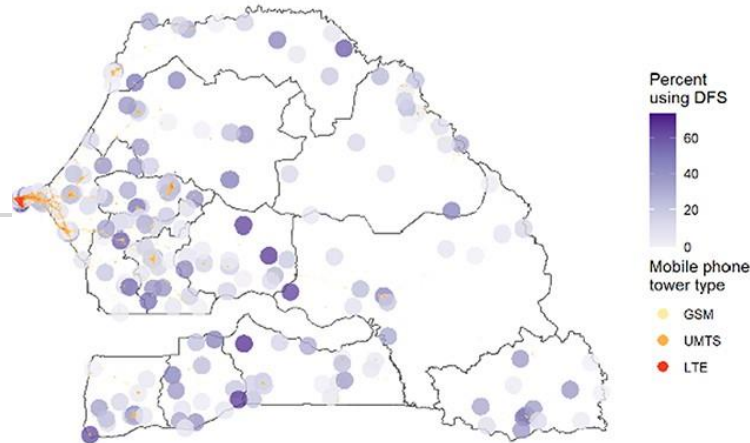
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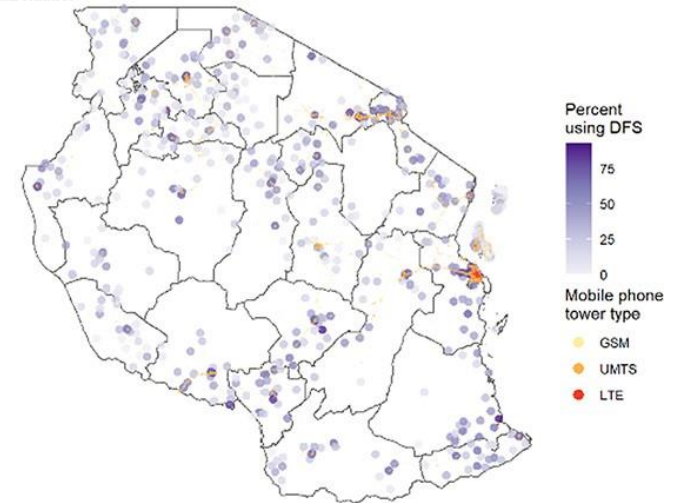
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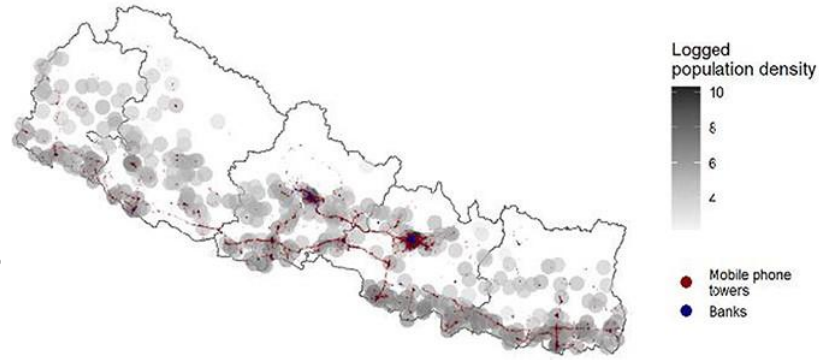


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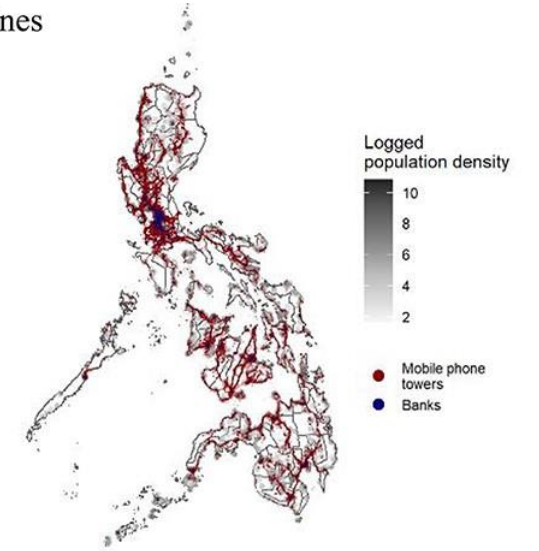


Mobile phone towers and banks are both concentrated in urban areas.

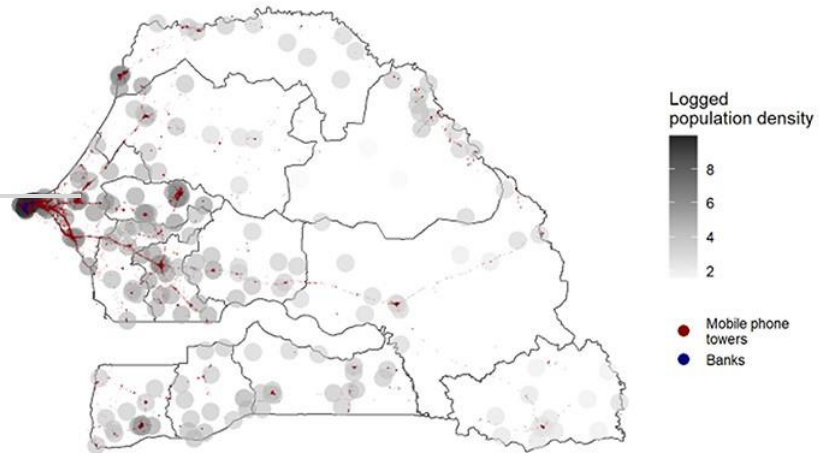
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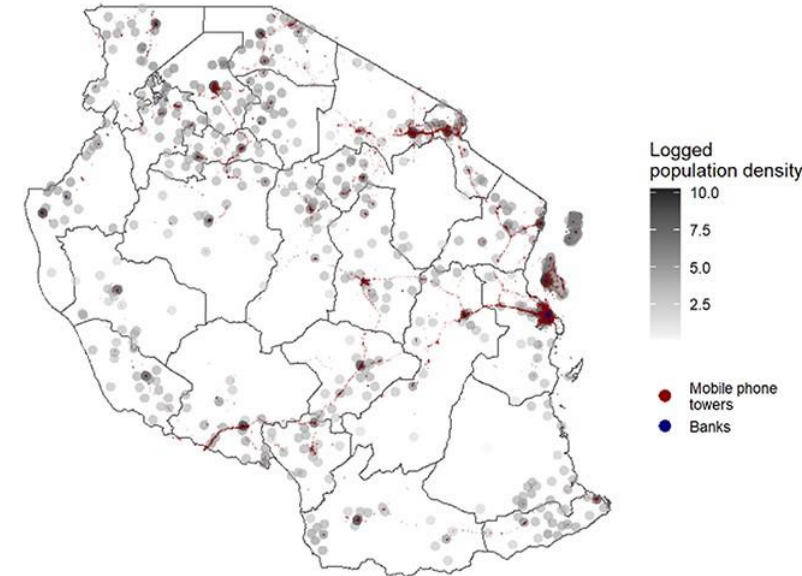
Philippines



Senegal

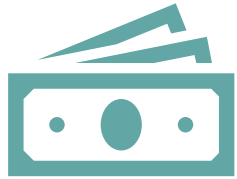


Tanzania



# Phone ownership is somewhat unequal.

Increase in likelihood of owning a phone associated with:



Wealthiest 20%

9.3 to 27.2  
percentage  
points



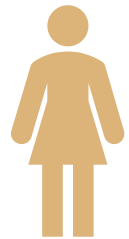
Urban areas

4.1 to 20.6  
percentage  
points



One more year  
of education

2.2 to 3.1  
percentage  
points



Female  
household head

2.0 to 13.5  
percentage  
points

# Implications: Affordability

Source: [Karlsson et al., 2018](#)

For the least well-off in Tanzania, a mobile phone costs

1/20

Cheapest available

1/6

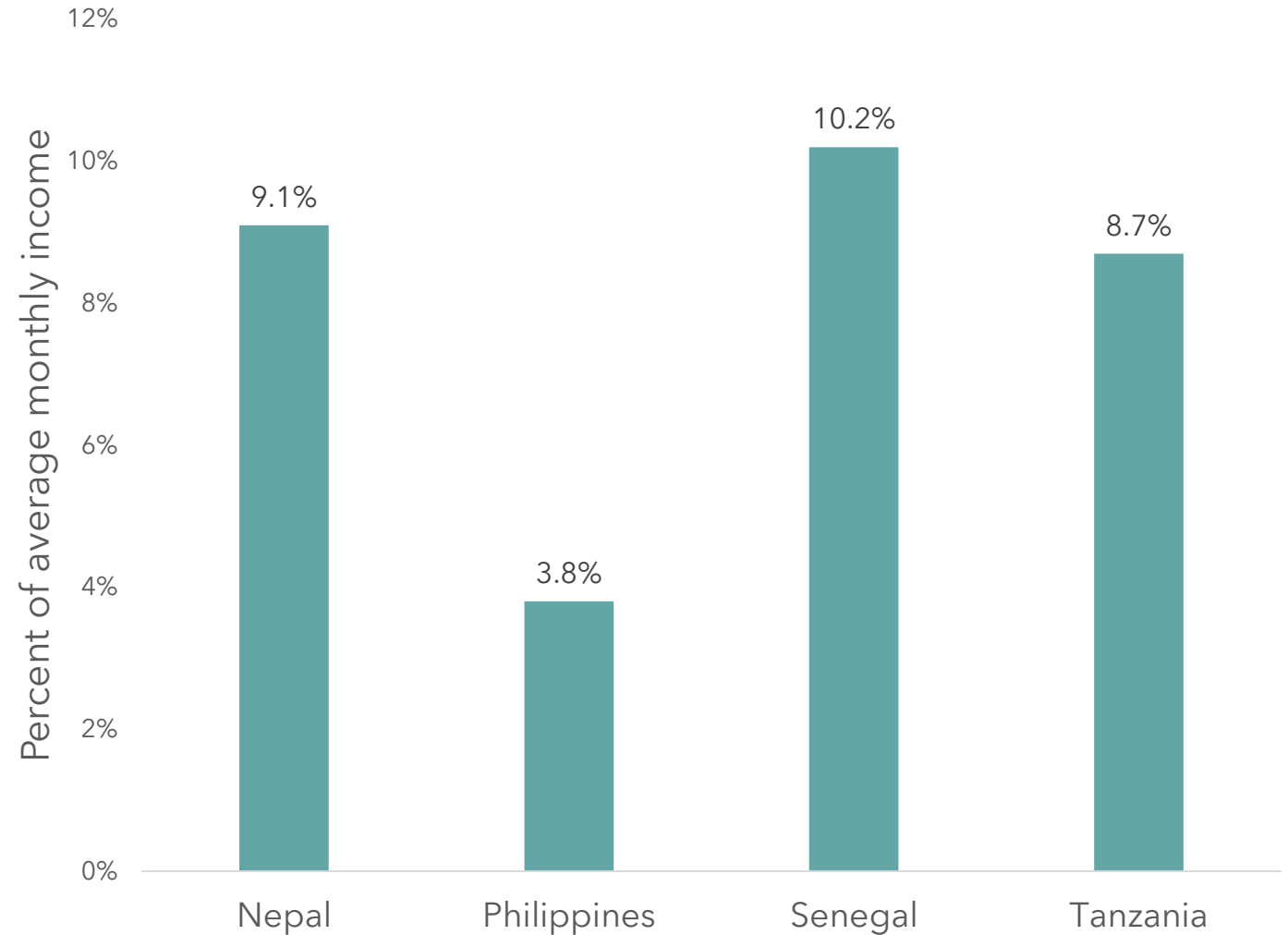
Smartphone

of annual income

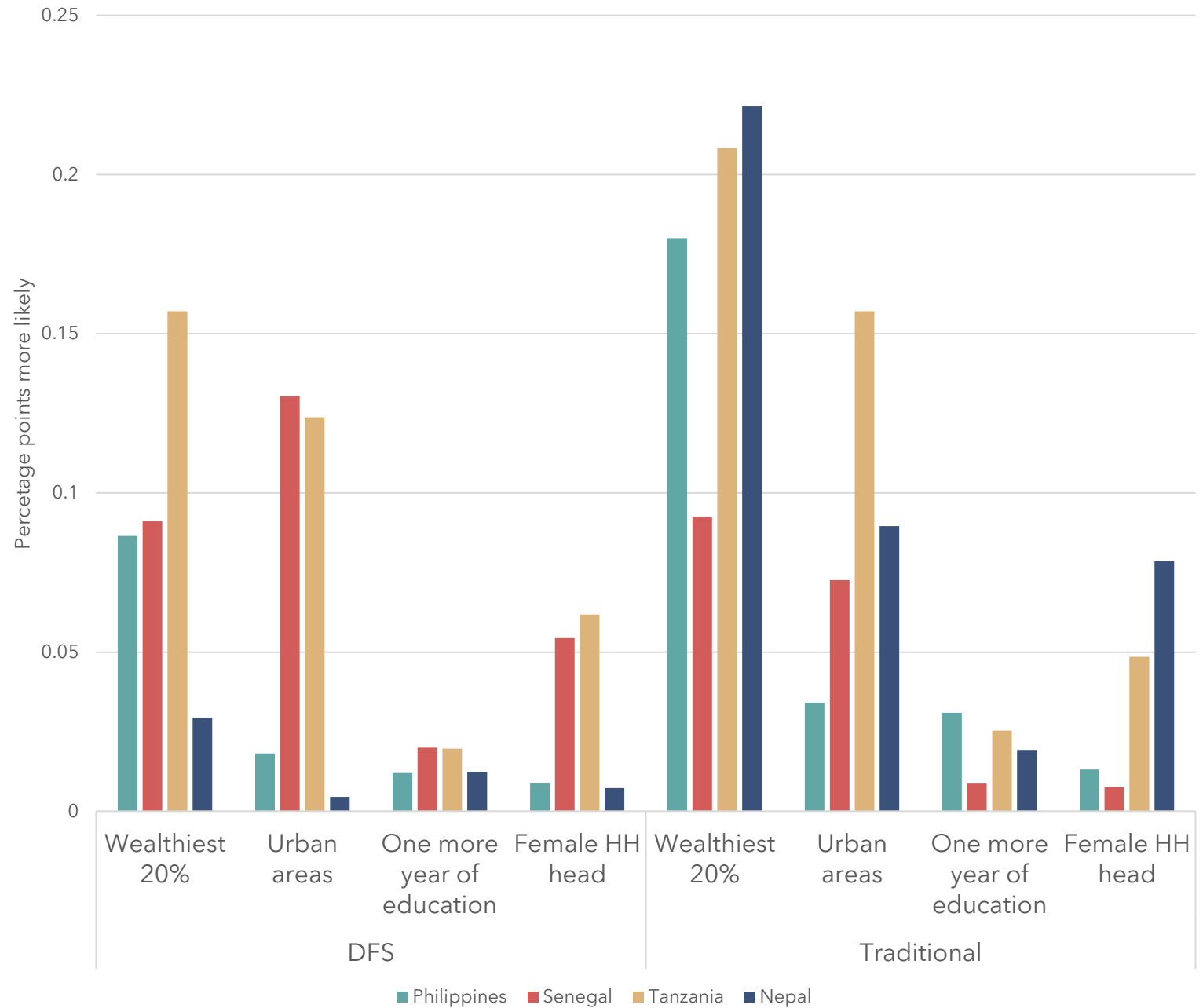
Mobile network access is very expensive

Source: A4AI, 2017

Cost of 1 gigabyte of mobile broadband



The same factors predict both traditional finance and DFS use





# Implications: Infrastructure systems

- Being in an urban area is almost just as important for DFS use as for traditional finance
- Mobile phone network quality and cash-in-cash-out points are likely concentrated in urban areas
- To unlock the equalizing power of DFS, need to invest in the physical infrastructure that supports it

# Implications: Gender dimensions

- Women's access to finance increases when they head their households
- DFS has potential to enable women to create financial accounts
- But, to date, male household heads may still handle financial matters, leaving non-HH head women without access

# Implications: Literacy and accessibility

- Education is a strong predictor of both DFS and traditional finance use
- Financial literacy is key to being able to use these tools
- Education may be particularly important when DFS are difficult to understand and transactions are performed without assistance
- Key to ensuring responsible and fair finance

# Conclusions

01

Mobile DFS use is concentrated among the wealthy, educated, and those in urban areas. It is just as (or more) spatially unequal as traditional finance.

02

Although mobile phone ownership rates are high, network quality may be highly concentrated. Mobile phones and broadband access can become expensive.

03

Without specific attention to affordability, infrastructure, gender dynamics, and literacy, mobile DFS may perpetuate the inequalities in access to traditional finance.

# Thank you!



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Caron, Laura. "Empty digital wallets: new technologies and old inequalities in digital financial services among women." *Oxford Open Economics* 1 (2022).

<https://doi.org/10.1093/ooec/odac001>