

# Tapping Into Advertising Platforms to Monitor ICT Usage and More

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# tl;dr

- Online advertising platforms provide information on how many of their users match certain targeting criteria
- How many *female* Facebook users in *Geneva City used to live in France* and use an *iPhone 8 (Plus)* on *4G* to access FB? Answer: 1,200.
- This type of information can be used to monitor online gender gaps, income inequalities, migration and more
- Supported by FB, LI, IG, Google, VK, ...

# Facebook's Advertising Platform

The screenshot displays the Facebook Ads Manager interface. At the top left, the Facebook logo and 'Ads Manager' are visible. A search bar is located at the top right. The main content area is divided into several sections:

- Location Selection:** A dropdown menu shows 'People who live in this location' with 'Switzerland' selected. Below this, a map of Switzerland is displayed with a blue pin on the country. A yellow arrow points to the 'Switzerland' selection in the dropdown.
- Age and Gender Targeting:** Below the map, there are controls for 'Age' (set to 13-65+) and 'Gender' (set to All). A yellow arrow points to the 'Age' dropdown, and another yellow arrow points to the 'Gender' dropdown.
- Audience Size:** A gauge chart shows the audience selection is 'Broad'. Text next to it states: 'Your audience selection is broad. This requires a large budget.' Below this, 'Potential Reach: 3,800,000 people' is displayed, with the number circled in red.
- Estimated Daily Results:** A section titled 'Estimated daily results' shows 'Reach: 870-5,400' with a progress bar. Below this, a disclaimer states: 'The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.' A link 'Were these estimates helpful?' is also present.

<https://www.facebook.com/adsmanager/creation/>

# Gender Gaps on Facebook

People who live in this location ▼


Switzerland

Switzerland

Include ▼ | Type to add more locations | Browse

Your audience location has been changed from Geneva to Switzerland. Undo change

Locations ⓘ



Add locations in bulk

Age ⓘ 13 ▼ - 65+ ▼

Gender ⓘ All Men Women

*(Yellow arrow points to the location selection area)*

*(Yellow arrow points to the Gender selection area)*

## Audience size



Your audience selection is broad. This requires a large budget.

Potential Reach: 1,900,000 people ⓘ

## Estimated daily results

### Reach

840-5,200 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?

# Gender Gaps on Facebook

People who live in this location ▼


Switzerland

✓ Switzerland

Include ▼ | Type to add more locations | Browse

**i** Your audience location has been changed from Geneva to Switzerland. Undo change

**Locations** **i**



Drop Pin

Age **i** 13 ▼ - 65+ ▼

**Gender** **i** All Men **Women**

## Audience size



Your audience selection is broad. This requires a large budget.

Potential Reach: 1,900,000 people **i**

## Estimated daily results

### Reach

840-5,300 **i**

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?


# Gender Gaps on Facebook

People who live in this location ▼

India

India

Include ▼ | Type to add more locations | Browse



Locations ⓘ

Drop Pin

## Audience size



Your audience selection is broad. This requires a large budget.

Potential Reach: 300,000,000 people ⓘ

## Estimated daily results

### Reach

15,000-97,000 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?

Age ⓘ 13 ▼ - 65+ ▼

Gender ⓘ All Men Women


# Gender Gaps on Facebook

People who live in this location ▼

India

India

Include ▼ | Type to add more locations | Browse



Locations ⓘ

Drop Pin

Add locations in bulk

Age ⓘ 13 ▼ - 65+ ▼

Gender ⓘ All Men Women



### Audience size



Your audience selection is broad. This requires a large budget.

Potential Reach: 230,000,000 people ⓘ

### Estimated daily results

Reach  
10,000-62,000 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?


# Gender Gaps on Facebook

People who live in this location ▼

India

India

Include ▼ | Type to add more locations | Browse



Map showing India and surrounding regions (Tajikistan, Afghanistan, Pakistan, Nepal, Bangladesh, Myanmar, Laos, Vietnam, Cambodia, Philippines, Sri Lanka, Iran, United Arab Emirates, Yemen, Oman). A location pin is placed over India.

Locations ⓘ

Age ⓘ

13 ▼ - 65+ ▼

All Men **Women**



### Audience size



Your audience selection is broad. This requires a large budget.

Potential Reach: 64,000,000 people ⓘ

### Estimated daily results

**Reach**  
4,900-30,000 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?



# www.digitalgendergaps.org

## Digital Gender Gaps

Measuring digital gender inequalities in real-time

[Home](#) [Data](#) [About](#) ▾

# Using big data to measure global gender gaps in internet and mobile access

Tracking progress on gender inequalities in internet and mobile access and use is more important than ever to ensure that women benefit from the digital revolution. Data on gender gaps in internet and mobile phone use and access are significantly lacking geographical coverage, comparability, and are slow to be updated.

We show how big data can help close this gender data gap and measure progress towards this important development goal in real-time.

## Latest indicators

Check out the latest internet and mobile gender gap indicators.

[Reports](#) »

## Project details

See the background of the project, and an overview of how the data is collected and processed.

[Project](#) »

## Team

Meet the project members.

[Team](#) »

A collaboration between

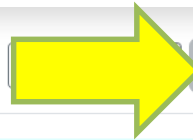


With support from



# www.digitalgendergaps.org

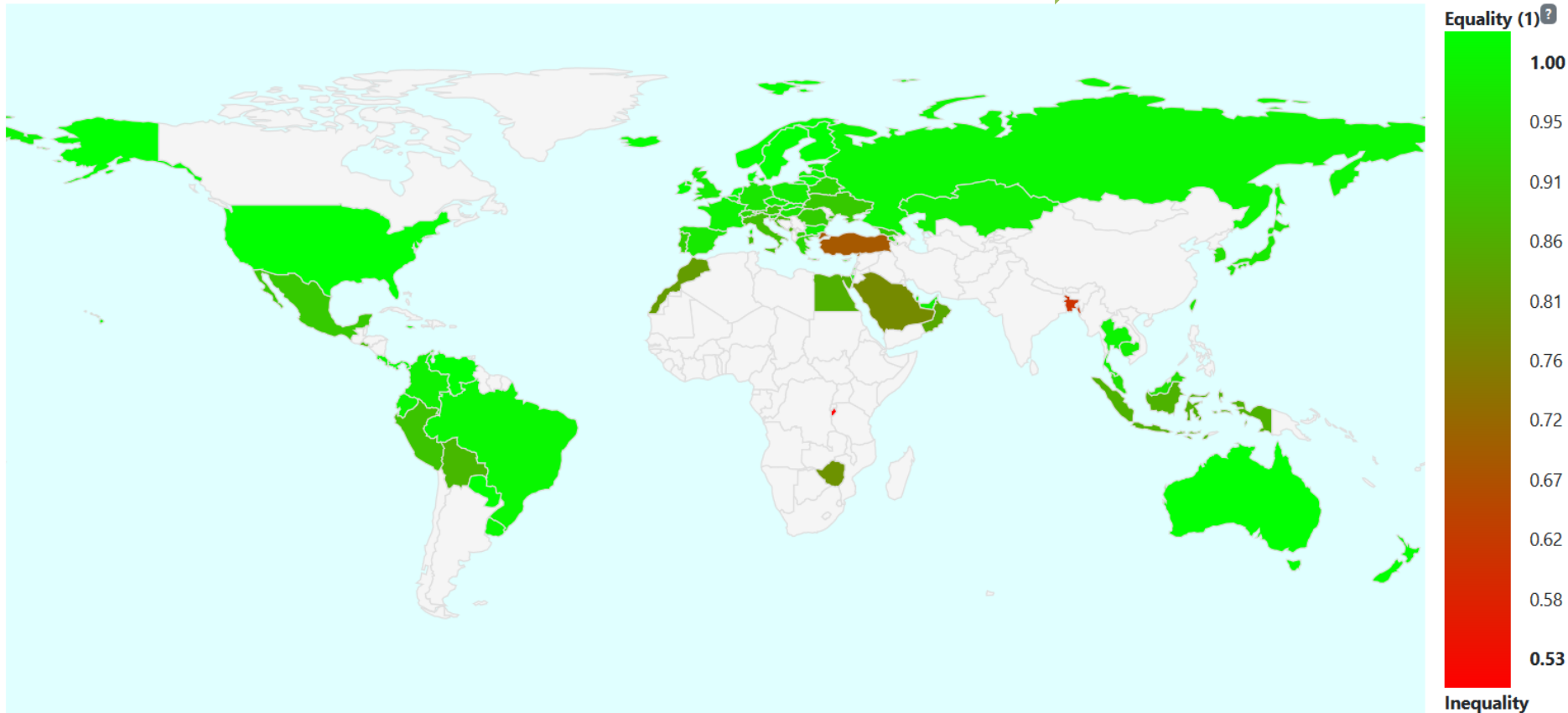
Report - 2018-12-09



Internet GG - ITU

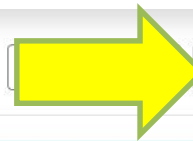
Share

Export



# www.digitalgendergaps.org

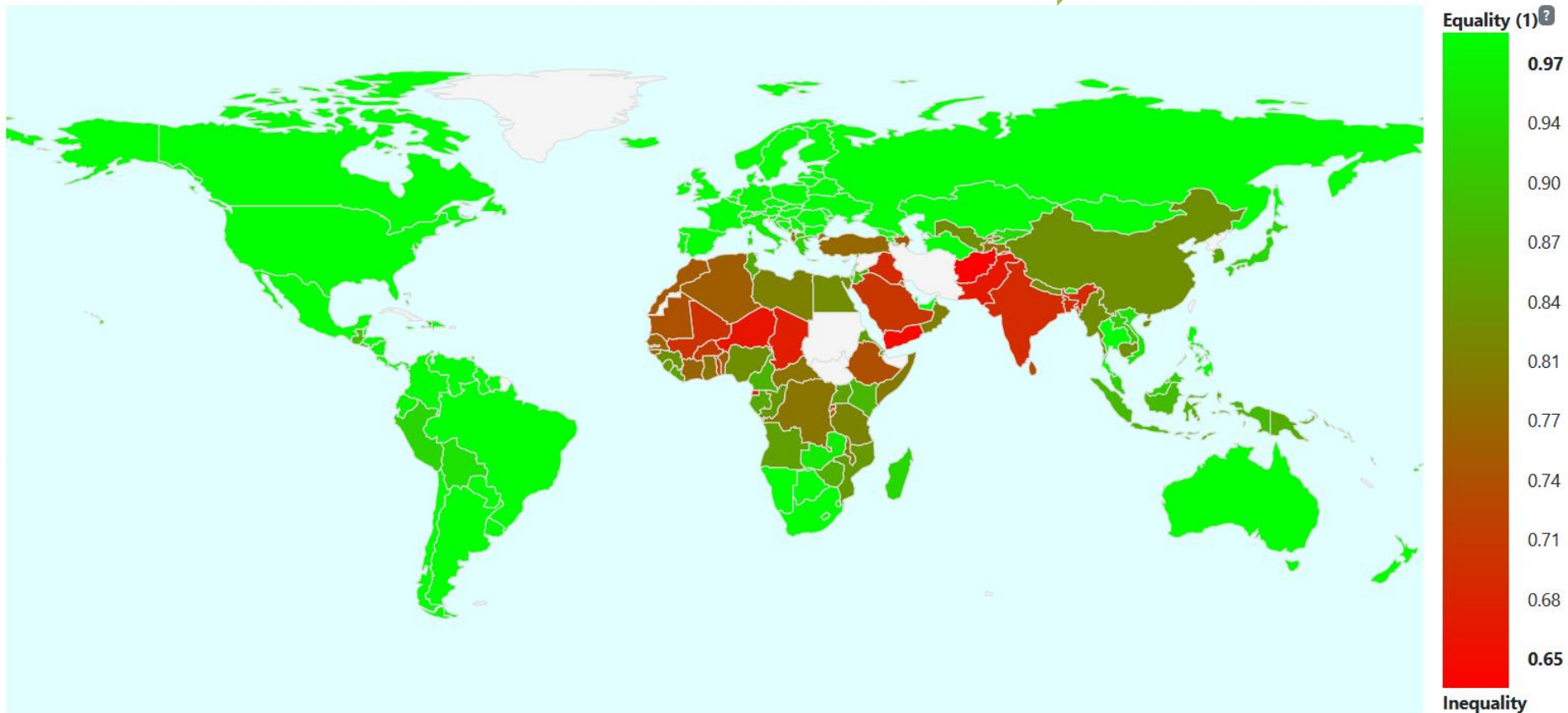
Report - 2018-12-09



Internet GG - Online

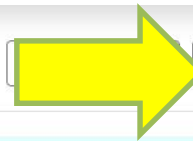
Share

Export



# www.digitalgendergaps.org

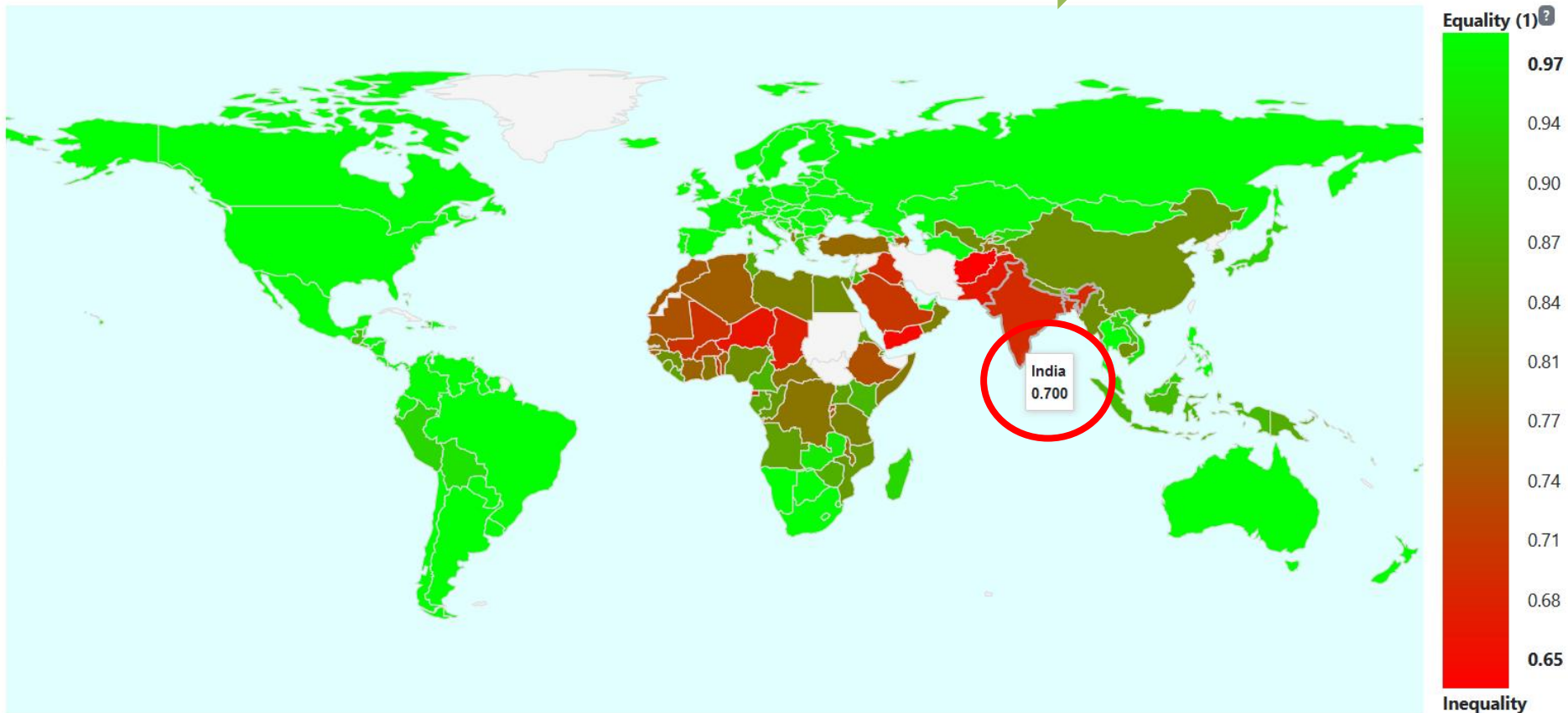
Report - 2018-12-09



Internet GG - Online

Share

Export



# www.digitalgendergaps.org

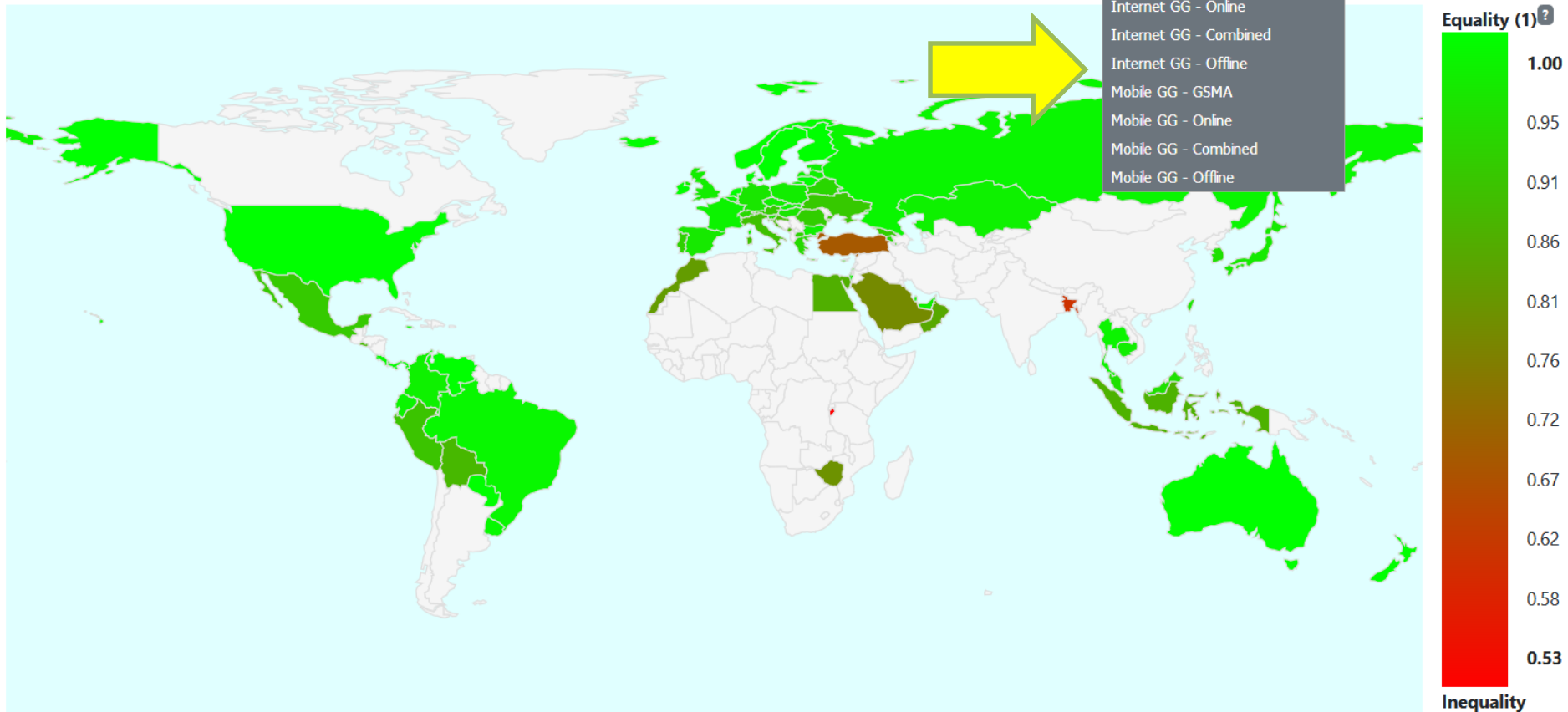
Report - 2018-12-09

Latest

Internet GG - ITU

Share

Export



# Modeling Internet Access Gender Gaps

	Online Model	Onl.-Offl. Model	Offline Model
Intercept	0.933*** (0.006)	0.932*** (0.005)	0.933*** (0.007)
FB GG (age 18+)	0.071*** (0.011)	0.093*** (0.017)	
log(GDP per capita)		0.018* (0.008)	
GGGR – Literacy		-0.018 (0.016)	
GGGR – Education		-0.019 (0.019)	
Internet Penetration			0.040*** (0.009)
GGGR – Tertiary Educ.			0.032 (0.021)
GGGR – Economy			0.043** (0.014)
GGGR Score			-0.024 (0.012)
Adjusted R-squared	0.691	0.791	0.615
# predicted countries <sup>a</sup>	152	127	132

\*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05.

“Using Facebook ad data to track the global digital gender gap”,  
M. Fatehkia, R. Kashyap, I. Weber, World Development, 2018


# Device Type as Proxy for Income

People who live in this location ▼

India

**Bihar**

Include ▼ | Type to add more locations | Browse



Locations ⓘ

Age ⓘ 13 ▼ - 65+ ▼

Gender ⓘ All Men Women

## Audience size



Your audience selection is fairly broad.

Potential Reach: 12,000,000 people ⓘ

## Estimated daily results

### Reach

5,400-34,000 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?


# Device Type as Proxy for Income

People who live in this location ▼

India

**Delhi**

Include ▼ | Type to add more locations | Browse



Locations ⓘ

Age ⓘ 13 ▼ - 65+ ▼

Gender ⓘ All Men Women

## Audience size



Your audience selection is fairly broad.

Potential Reach: 14,000,000 people ⓘ

## Estimated daily results

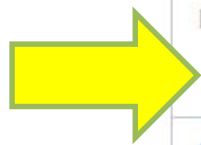
### Reach

4,300-27,000 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?





India

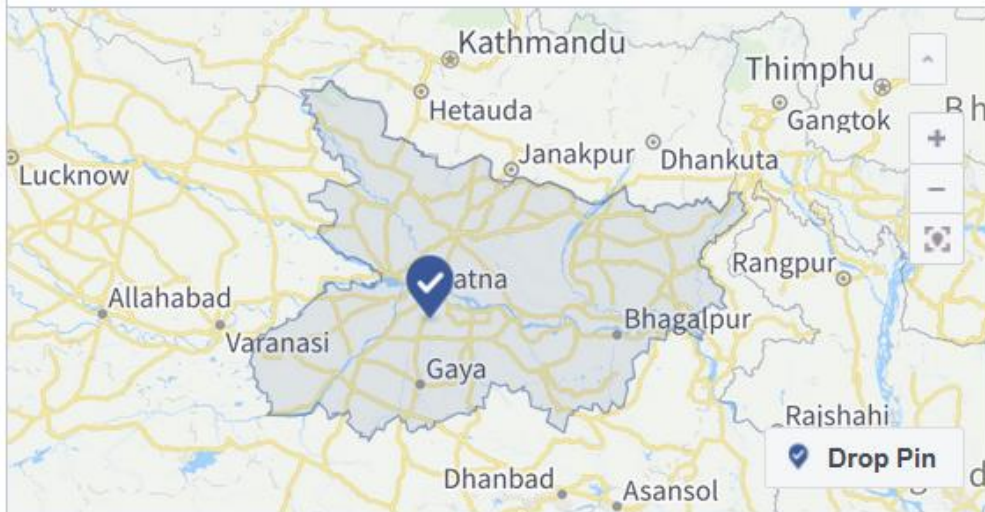
**Bihar**

Include

Type to add more locations

Browse

Locations



Add locations in bulk

Age

13

65+

Gender

All

Men

Women

Languages

Enter a language...

INCLUDE people who match at least ONE of the following

Behaviours > Mobile Device User

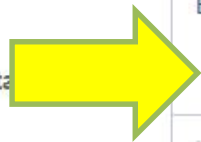
**Facebook access (mobile): feature phones**

Add demographics, interests or behaviours

Suggestions

Browse

Detailed targeting



### Audience size



Your audience selection is fairly broad.

Potential Reach: 1,000,000 people

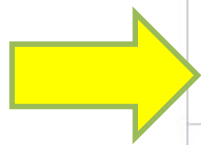
### Estimated daily results

Reach

3,600-22,000

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?



India

**Delhi**

Include | Type to add more locations | Browse

Drop Pin

Locations ⓘ

Add locations in bulk

Age ⓘ

13 ▼ - 65+ ▼

Gender ⓘ

All Men Women

Languages ⓘ

Enter a language...

INCLUDE people who match at least ONE of the following ⓘ

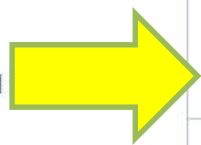
Behaviours > Mobile Device User

**Facebook access (mobile): feature phones**

Add demographics, interests or behaviours

Suggestions | Browse

Detailed



### Audience size



Your audience selection is fairly broad.

Potential Reach: 440,000 people ⓘ

### Estimated daily results

**Reach**

2,700-17,000 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?

# Examples of Targetable Devices

**INCLUDE** people who match at least **ONE** of the following 

[Behaviours](#) > [Mobile Device User](#) > [All Mobile Devices by Brand](#) > [Apple](#)

**Facebook access (mobile): iPhone 8**

**Facebook access (mobile): iPhone 8 Plus**

**Facebook access (mobile): iPhone X**

[Behaviours](#) > [Mobile Device User](#) > [All Mobile Devices by Brand](#) > [Samsung](#)

**Owns: Galaxy S8**

**Owns: Galaxy S8+**

**Owns: Galaxy S9**

**Owns: Galaxy S9+**

[Add demographics, interests or behaviours](#)

[Suggestions](#)

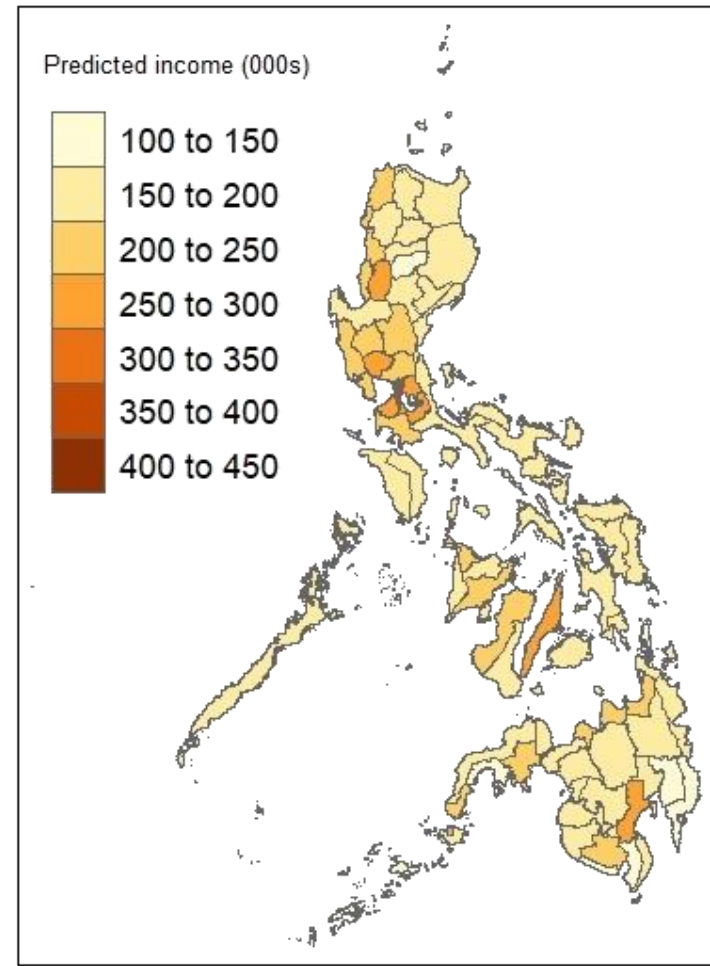
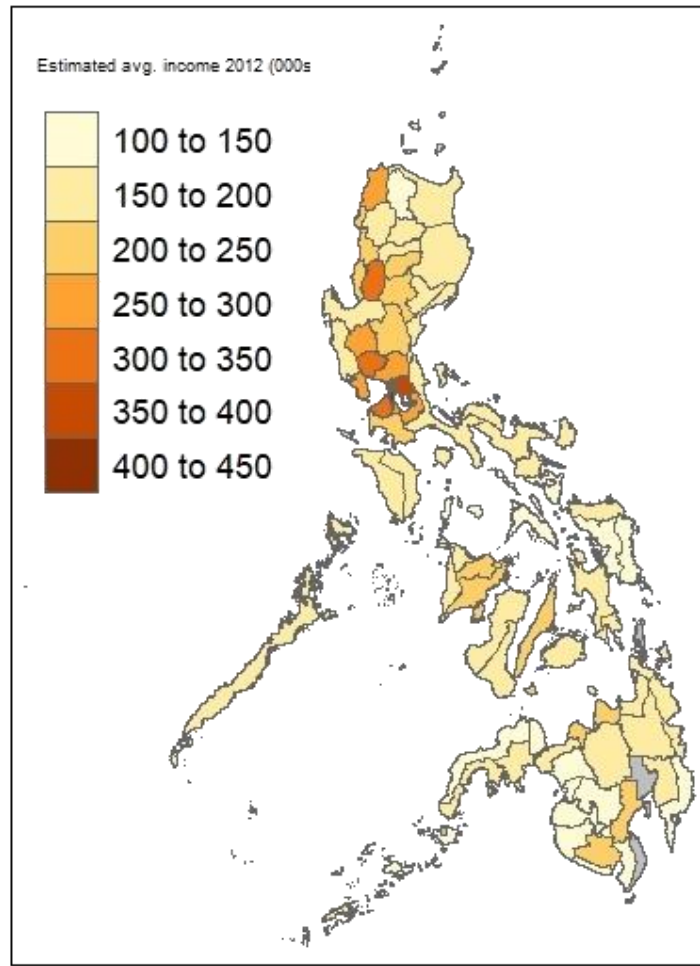
[Browse](#)

[Exclude people or Narrow audience](#)

Detailed targeting 



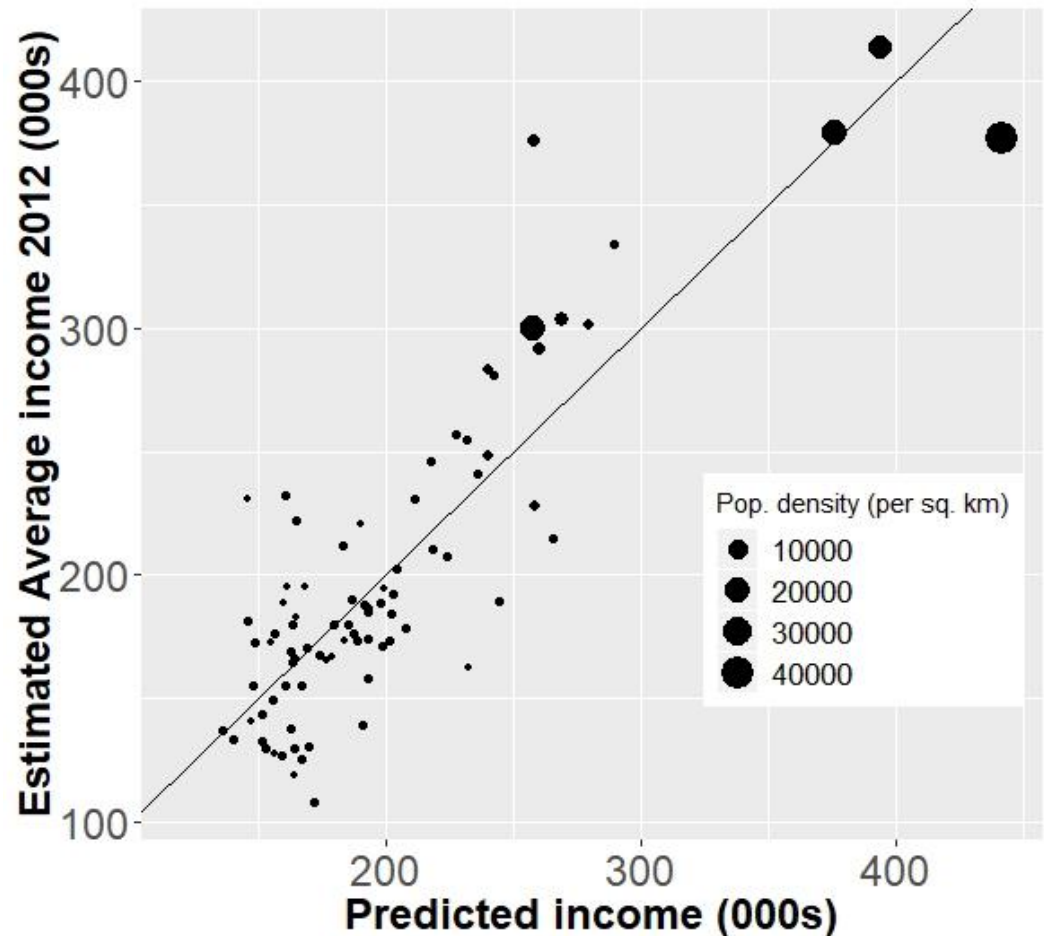
# Philippines: Regional Income Inequalities



# Philippines: Regional Income Inequalities

Most predictive features:  
%-age high end devices ( $r=.83$ )  
FB penetration ( $r=.81$ )

Adj.  $R^2 = .72$



# Brazil: State-Level Ground Truth (2016)

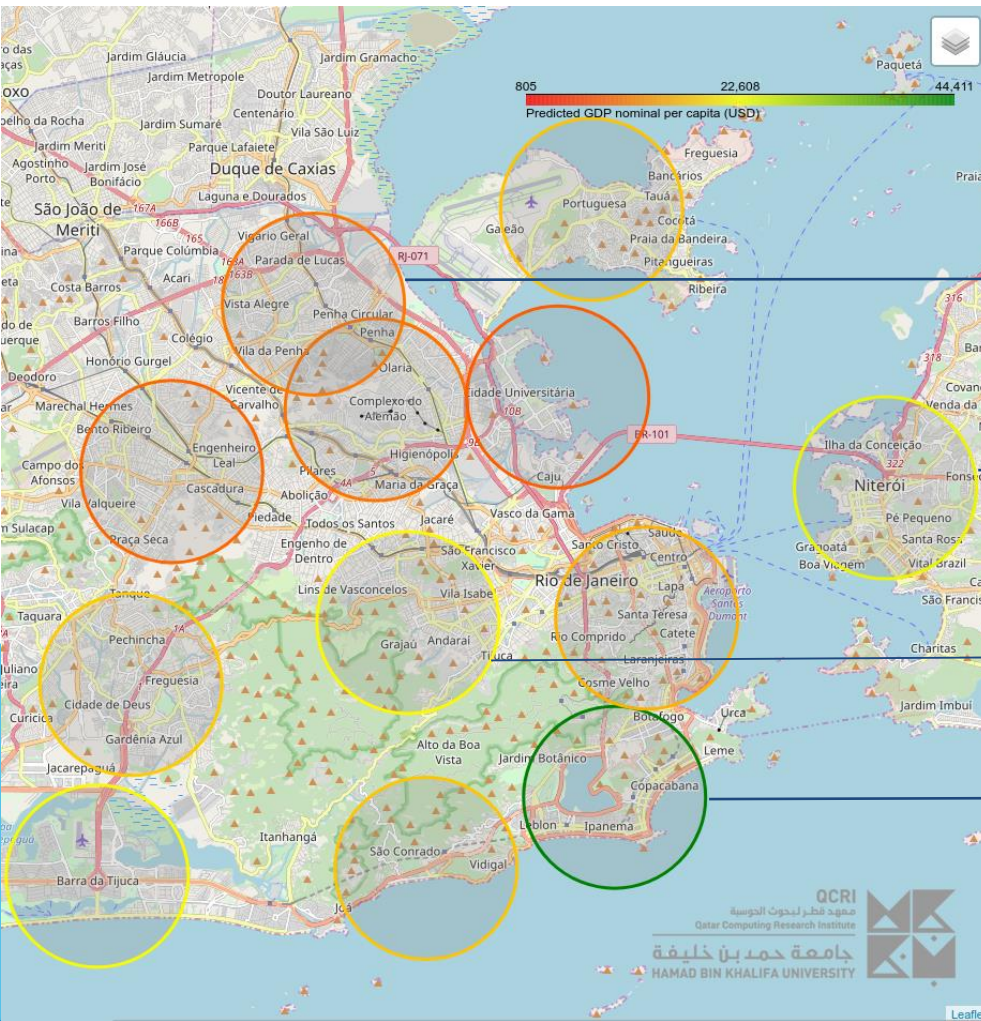


# Brazil: State-Level Predictions



# Sub-City Income Monitoring

Average GDP nominal per capita for Rio de Janeiro city: ~USD 13K



GDP per capita between USD 8k and 11k

GDP per capita USD ~20k

GDP per capita USD ~44k



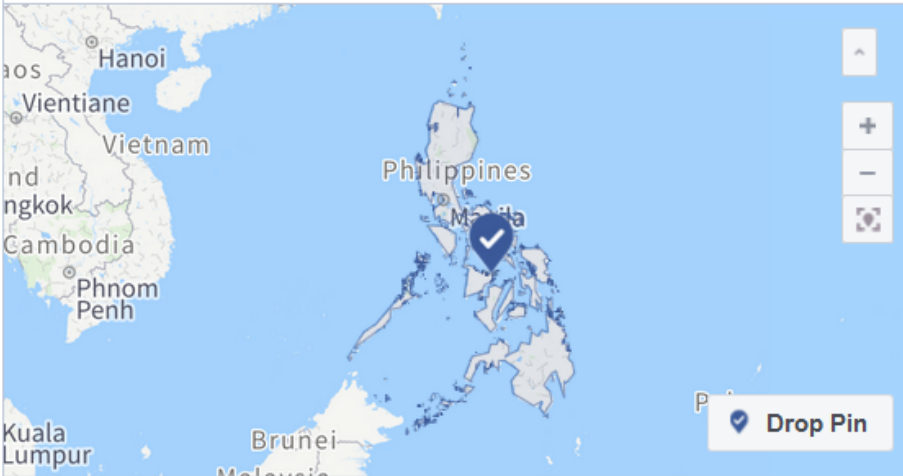
# Access Type as Proxy for Development

People who live in this location ▾

Philippines

Philippines

Include ▾ | Type to add more locations | Browse



Locations ⓘ

Age ⓘ 13 ▾ - 65+ ▾

Gender ⓘ All Men Women

A yellow arrow points to the 'Philippines' location selection in the dropdown menu.

## Audience size



Your audience selection is broad. This requires a large budget.

Potential Reach: 73,000,000 people ⓘ

## Estimated daily results

### Reach

4,700-30,000 ⓘ

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?

Philippines

**Philippines**

Include | Type to add more locations

Browse

Locations ⓘ



Add locations in bulk

Age ⓘ

13 - 65+

Gender ⓘ

All Men Women

Languages ⓘ

Enter a language...

INCLUDE people who match at least ONE of the following ⓘ

Behaviours > Mobile Device User > Network Connection

**Facebook access (network type): 4G**

Add demographics, interests or behaviours

Suggestions | Browse

### Audience size



Your audience selection is broad. This requires a large budget.

Potential Reach: 28,000,000 people

### Estimated daily results

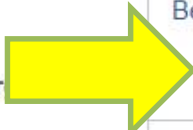
#### Reach

5,100-32,000

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?

Detailed targeting



# Targetable Access Types

INCLUDE people who match at least ONE of the following ⓘ

Behaviours > Mobile Device User > Network Connection

Facebook access (network type): 2G

Facebook access (network type): 3G

Facebook access (network type): 4G

Facebook access (network type): Wi-Fi

Add demographics, interests or behaviours

Suggestions | Browse

Exclude people or Narrow audience

Size: 997,556,534

Behaviours > Mobile Device User > Network Connection > Facebook access (network type): 4G

Description: People who primarily access Facebook using a 4G network

Report this as inappropriate

# Migration Monitoring

The screenshot displays the Facebook Audience Insights interface. A yellow arrow points to the location selection area, which includes a map of Colombia with 'Norte de Santander' selected. Below the map, there are filters for Age (13-65+), Gender (All, Men, Women), and Languages. A second yellow arrow points to the 'Behaviours > Ex-pats' filter dropdown, which is open to show 'Lived in Venezuela (formerly Expats - Venezuela)' with a size of 3,288,449. To the right, the 'Audience size' section features a gauge showing 'Broad' reach and a 'Potential Reach' of 100,000 people. The 'Estimated daily results' section shows a reach of 3,200-20,000.

**Locations**

Colombia

Norte de Santander

Include | Type to add more locations | Browse

Aruba

Caracas

Zulia

Panama

Venezuela

Antioquia

Arauca

Bogota

Vichada

Drop Pin

Add locations in bulk

Age 13 - 65+

Gender All Men Women

Languages Enter a language...

**Audience size**

Your audience selection is fairly broad.

Potential Reach: 100,000 people

**Estimated daily results**

Reach 3,200-20,000

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

Were these estimates helpful?

**Behaviours > Ex-pats**

Lived in Venezuela (formerly Expats - Venezuela) Size: 3,288,449

Add demographics, interests or behaviours | Suggestions | Browse

Behaviours > Ex-pats > Lived in Venezuela (formerly Expats - Venezuela)



# LinkedIn's Advertising Platform

STEP 3 OF 4: AUDIENCE CREATION  
Define who you want to see your ads



**Use a matched audience** (optional) Select  
Custom targeting options to reach your website visitors, contacts, and target accounts.

Target by

What location do you want to target? (required)

include  See full list



Switzerland x

Your estimated target audience  
**2,700,000+** LinkedIn members  
[Learn more](#)

- Switzerland
- Audience expansion: Enabled

LinkedIn tools may not be used to discriminate based on personal characteristics like gender, age, or actual or perceived race/ethnicity. [Learn more](#)

<https://www.linkedin.com/ad/accounts>

# Gender Gaps on LinkedIn

🌐 What location do you want to target? (required)

include ▾ Start typing a country, state, city, or town... [See full list](#)

include Switzerland ✕

Target people who permanently live or work in the selected location(s).  
Deliver ads to people who reside in the selected **location(s)** and are not recent visitors

👤 What gender do you want to target? ✕

By checking the box to enable this field, I certify that I will not use LinkedIn to discriminate based on gender or other protected characteristics in ads relating to employment, housing or credit. [Learn more](#)

- All
- Female
- Male

Your estimated target audience

1,100,000+ LinkedIn members

[Learn more](#)

🌐 Switzerland

👤 Female

👤 Audience expansion: Enabled

LinkedIn tools may not be used to discriminate based on personal characteristics like gender, age, or actual or perceived race/ethnicity. [Learn more](#)



# Gender Gaps on LinkedIn

🌐 What location do you want to target? (required)

include ▾ Start typing a country, state, city, or town... [See full list](#)

include Switzerland ✕

Target people who permanently live or work in the selected location(s).  
Deliver ads to people who reside in the selected **location(s)** and are not recent visitors

👤 What gender do you want to target? ✕

By checking the box to enable this field, I certify that I will not use LinkedIn to discriminate based on gender or other protected characteristics in ads relating to employment, housing or credit. [Learn more](#)

- All
- Female
- Male

Your estimated target audience

1,400,000+ LinkedIn members

[Learn more](#)

🌐 Switzerland

👤 Male

👤 Audience expansion: Enabled

LinkedIn tools may not be used to discriminate based on personal characteristics like gender, age, or actual or perceived race/ethnicity. [Learn more](#)



# Gender Skill Gaps on LinkedIn

📍 What location do you want to target? (required)

include ▾  [See full list](#)

include Switzerland ✕

Target people who permanently live or work in the selected location(s).  
Deliver ads to people who reside in the selected **location(s)** and are not recent visitors

👤 What gender do you want to target? ✕

By checking the box to enable this field, I certify that I will not use LinkedIn to discriminate based on gender or other protected characteristics in ads relating to employment, housing or credit. [Learn more](#)

- All
- Female
- Male

💡 What skills do you want to target? ✕

include ▾

include Artificial Intelligence (AI) ✕

Your estimated target audience

**2,000+** LinkedIn members

[Learn more](#)

📍 Switzerland

👤 Female

💡 Artificial Intelligence (AI)

👤 Audience expansion: Enabled

LinkedIn tools may not be used to discriminate based on personal characteristics like gender, age, or actual or perceived race/ethnicity. [Learn more](#)





# Gender Skill Gaps on LinkedIn

🌐 What location do you want to target? (required)

include ▾ Start typing a country, state, city, or town... [See full list](#)

include Switzerland ✕

Target people who permanently live or work in the selected location(s).  
Deliver ads to people who reside in the selected **location(s)** and are not recent visitors

👤 What gender do you want to target? ✕

By checking the box to enable this field, I certify that I will not use LinkedIn to discriminate based on gender or other protected characteristics in ads relating to employment, housing or credit. [Learn more](#)

- All
- Female
- Male

💡 What skills do you want to target? ✕

include ▾ Start typing a skill...

include Artificial Intelligence (AI) ✕

Your estimated target audience

9,000+ LinkedIn members

[Learn more](#)

🌐 Switzerland

👤 Male

💡 Artificial Intelligence (AI)

👤 Audience expansion: Enabled

LinkedIn tools may not be used to discriminate based on personal characteristics like gender, age, or actual or perceived race/ethnicity. [Learn more](#)

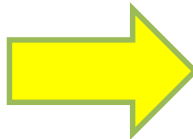


# Google's Advertising Platform

## Locations

Select locations to target <sup>?</sup>

- All countries and territories
- Qatar
- Enter another location



Targeted locations (1)

Switzerland country

Location options

Your targeting's reach <sup>?</sup>

Impressions  
**3B**

What's defining your reach <sup>?</sup>

Your weekly estimates <sup>?</sup>

Enter a budget to see your estimated performance

## Languages

Select the languages your customers speak <sup>?</sup>

All languages

<https://ads.google.com/aw/campaigns/new/display>

Qatar Computing Research Institute

جامعة حمد بن خليفة  
HAMAD BIN KHALIFA UNIVERSITY



# Gender Employment Interests

The screenshot displays a targeting interface with two main sections. The top section, titled "What they are actively researching or planning", lists various job categories with checkboxes. A yellow arrow points to the "IT & Technical Jobs" checkbox, which is checked. Below this list is a button for "NEW CUSTOM INTENT AUDIENCE". The middle section, "In-market audiences", shows "Employment IT & Technical Jobs" with a close button. The right section, "Your targeting's reach", shows "Impressions 8.6M" circled in red. Below this is a section for "Your weekly estimates" with a prompt to enter a budget. The bottom section, "Demographics", is titled "Reach people based on age, gender, parental status, or household income". A blue bar above it says "Edit targeted demographics" and "DONE". A yellow arrow points to the "Gender" column, where "Female" is checked. The "Age" column has "18 - 24", "25 - 34", and "35 - 44" checked. The "Parental status" column has "Not a parent", "Parent", and "Unknown" checked. The "Household income" column has "Top 10%", "11 - 20%", and "21 - 30%" checked.

What they are actively researching or planning

- Executive & Management Jobs
- Government & Public Sector Jobs
- Health & Medical Jobs
- IT & Technical Jobs
- Internships
- Legal Jobs
- Resumes & Portfolios
- Detail Jobs

**NEW CUSTOM INTENT AUDIENCE**  
Use keywords and URLs to create a custom audience

In-market audiences

Employment IT & Technical Jobs

Your targeting's reach <sup>?</sup>

Impressions **8.6M**

What's driving your reach <sup>?</sup>

Your weekly estimates <sup>?</sup>

Enter a budget to see your estimated performance

Demographics

Reach people based on age, gender, parental status, or household income <sup>?</sup>

Edit targeted demographics **DONE**

Gender	Age	Parental status	Household income
<input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> 18 - 24	<input checked="" type="checkbox"/> Not a parent	<input checked="" type="checkbox"/> Top 10%
<input type="checkbox"/> Male	<input checked="" type="checkbox"/> 25 - 34	<input checked="" type="checkbox"/> Parent	<input checked="" type="checkbox"/> 11 - 20%
<input type="checkbox"/> Unknown <sup>?</sup>	<input checked="" type="checkbox"/> 35 - 44	<input checked="" type="checkbox"/> Unknown <sup>?</sup>	<input checked="" type="checkbox"/> 21 - 30%

# Gender Employment Interests

← What they are actively researching or planning

- Executive & Management Jobs
- Government & Public Sector Jobs
- Health & Medical Jobs
- IT & Technical Jobs
- Internships
- Legal Jobs
- Resumes & Portfolios
- Detail Jobs

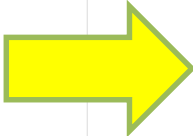
**+ NEW CUSTOM INTENT AUDIENCE**  
Use keywords and URLs to create a custom audience

In-market audiences

Employment  
IT & Technical Jobs

Your targeting's reach ?  
Impressions  
**14M**  
What's defining your reach ?

Your weekly estimates ?  
Enter a budget to see your estimated performance



## Demographics

Reach people based on age, gender, parental status, or household income ?

### Edit targeted demographics

DONE

#### Gender

- Female
- Male
- Unknown ?

#### Age

- 18 - 24
- 25 - 34
- 35 - 44

#### Parental status

- Not a parent
- Parent
- Unknown ?

#### Household income

- Top 10%
- 11 - 20%
- 21 - 30%

# Summary: Advertising Audience Estimates

- + Global reach with over 2 billion users
- + FB, LinkedIn, Google, Twitter, Snapchat, Instagram, vKontakte, ...
- + Real-time estimates
- + Uses anonymous and aggregate data
- + Disaggregation by gender, age, location, country of origin, ...
- + Includes non-traditional attributes such as interests and skills
  
- Proprietary black box on how attributes are inferred
- Needs modeling for bias correction, *don't use at face value*
- Needs periodic adjustments of the models as usage patterns change

# Key Partners



data2x



Better Data | Better Decisions | **Better Outcomes**

# Amazing Collaborators!

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# Thanks!

Want to collaborate? Get in touch:  
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References and full texts: <https://ingmarweber.de/publications/>