

# **Analysis to improve handset affordability**

**GSMA Handset Affordability Coalition**

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# Bridging the Digital Divide: Analysis to improve handset affordability

## Background

- 3 billion people – 38% of the world’s population – primarily women, rural residents, and low-income individuals in LMICs, are not using mobile internet despite having mobile broadband coverage. Handset affordability is often recognised as one of the most important barriers to get people online

## The GSMA Handset Affordability Coalition

- To address this issue, the GSMA has established a global coalition which brings together key stakeholders to advance innovative solutions to enhance handset affordability for low- and middle-income countries (LMICs). Members include major global mobile operators, vendors, device ecosystem players, international organisations and financing institutions.

## Objectives of this research

- This research piece aims to provide the industry with key data and insights, focusing on cost assessments and affordability analyses, to tackle the smartphone affordability challenges

# Bills of Materials (BOM) for internet-enabled devices

# Bills of Material analysis

## Background

- Bills of Materials (BOM) account for 50-70% of handset costs. Therefore, any efforts to reduce the cost of internet-enabled devices will require further reductions in BoM.

## Objectives

- To better understand BOM costs by breaking them down into individual components.
- Identify any components that could potentially enable even lower cost handsets.

# There are myriad ways of looking at device Bill of Materials

front camera	rear camera	display	user interface
memory - RAM	memory - NAND	processor - AP	processor - BB
battery	sensors	cellular RF: transceiver	cellular RF: power amp
non-cellular RF	GPS / GNSS	PCB	casing
mechanicals	Electro-mechanicals	glue logic	power management
assembly	testing	packaging	box contents

- The universe and diversity of potential BOM categories is very extensive.
- The diversity derives from a number of dynamics.
  - component bundling and combinations
  - definitional choices
  - limited information
- The diversity also makes it very difficult to directly compare data from different sources and different devices.

# BOM can be grouped into a standard set of components

processor (AP/BB)	display	camera
RF-cellular	RF-other	memory
battery	sensors (incl GPS)	PCB + casing + mechanicals

*Excludes packaging, box content, assembly, license fees, IPR, manufacturing, shipping, documentation.*

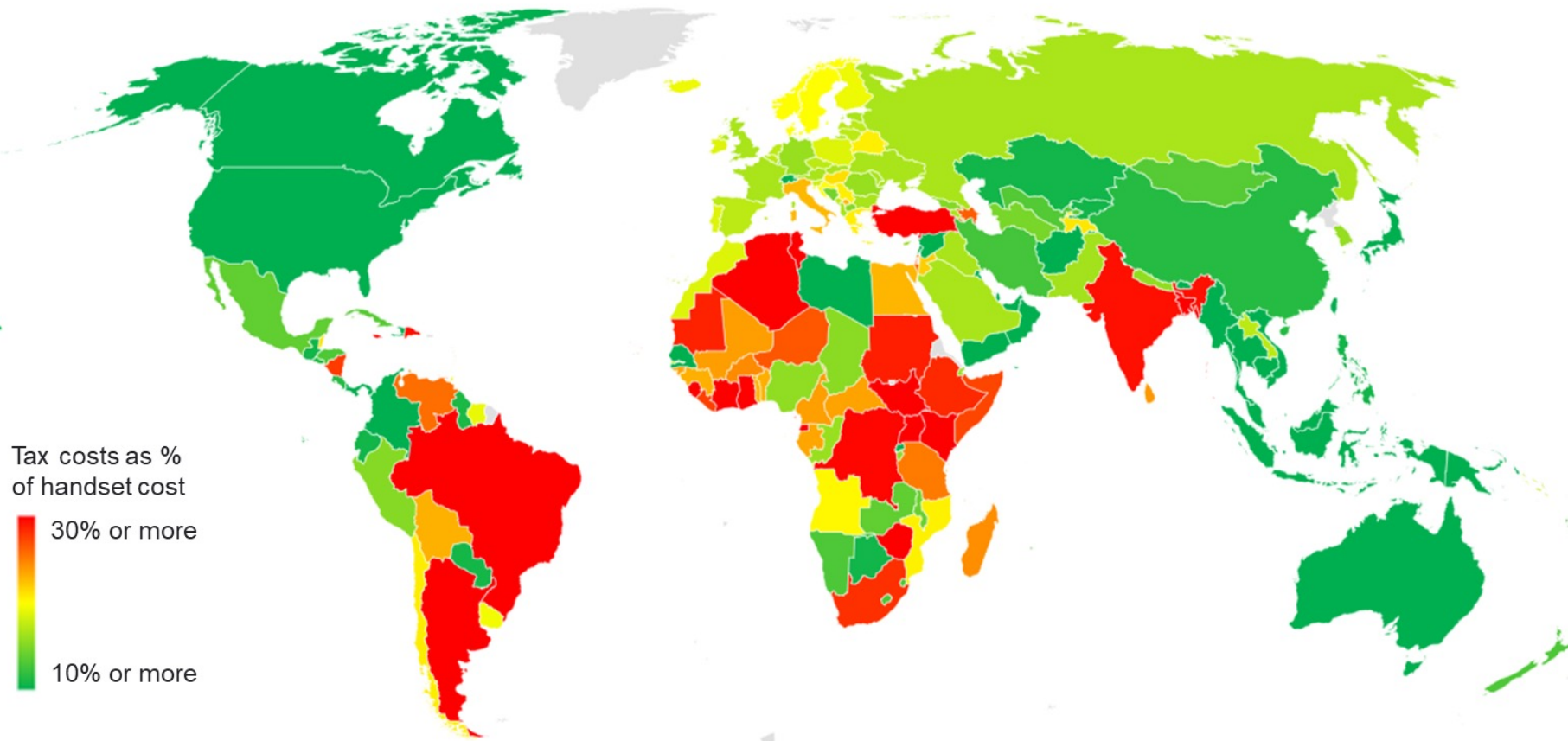
- For the sake of comparison, BOM costs must be grouped into a small set of components.
- While a “one-size-fits-all” model may not be possible for capturing the costs of a specific device, it will work in aggregate.
- It will also be appropriate for a theoretical low-cost device.
- Grouping component types and allows for a comparable sub-set which should capture 90%+ of BOM costs.

# BOM can be grouped into a standard set of components

	OVERALL			LOW COST 4G	LOW COST 5G
	AVG	LOW (RANGE)	HIGH (RANGE)		
Display	~20%	15%	35%	~ 20%	~ 15%
Processor	~15%	10%	20%	10% to 15%	~ 20%
PCB/Casing	~15%	10%	20%	10% to 15%	~ 10%
Memory	~15%	10%	20%	20% to 25%	~ 20%
Camera	~10%	5%	20%	~10%	~ 15%
RF-Cellular	~10%	5%	15%	~10%	~ 5%
RF-Other	sub-5%	1%	5%	sub-5%	sub-5%
Sensors	sub-5%	2%	5%	sub-5%	sub-5%
Battery	sub-5%	1%	7%	~5%	~5%

- No single component represents a large enough share of BOM to “move the needle” in terms of price to consumer.
- Substantially cutting costs of any major component could yield a less usable consumer device.
  - memory (vs. apps)
  - processor (vs. performance)
  - camera (vs. use cases)
  - RF (vs. coverage)
- IPR costs vary widely and depend on holdings of manufacturers

# What about non-BOM costs? Taxation plays a key role



- The main taxes that apply to handsets are general sales taxes (GST/VAT) and import duties
- Some countries impose additional taxes on handsets
- Others have exempted taxes on low-cost handsets entirely



# Affordability analysis for internet-enabled devices

# Smartphone affordability analysis

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**Goal:** Assessing affordability of different price points across countries to determine the impact of reducing device costs.

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**Country-Level Model:** Assessing affordability of different price points -(i) lowest-cost entry-level device, and (ii) average device price- in each country

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**Considerations:** Income distributions and the impact of reducing device costs on closing the usage gap.

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**Example:** Illustrative outcomes of the analysis based on affordability thresholds and potential impact on handset affordability.

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# What represents an affordable device?

## Research question

What is a suitable threshold for handsets being affordable?

Is it possible to set a reference comparable to the ITU target for mobile data (2% of monthly income)?

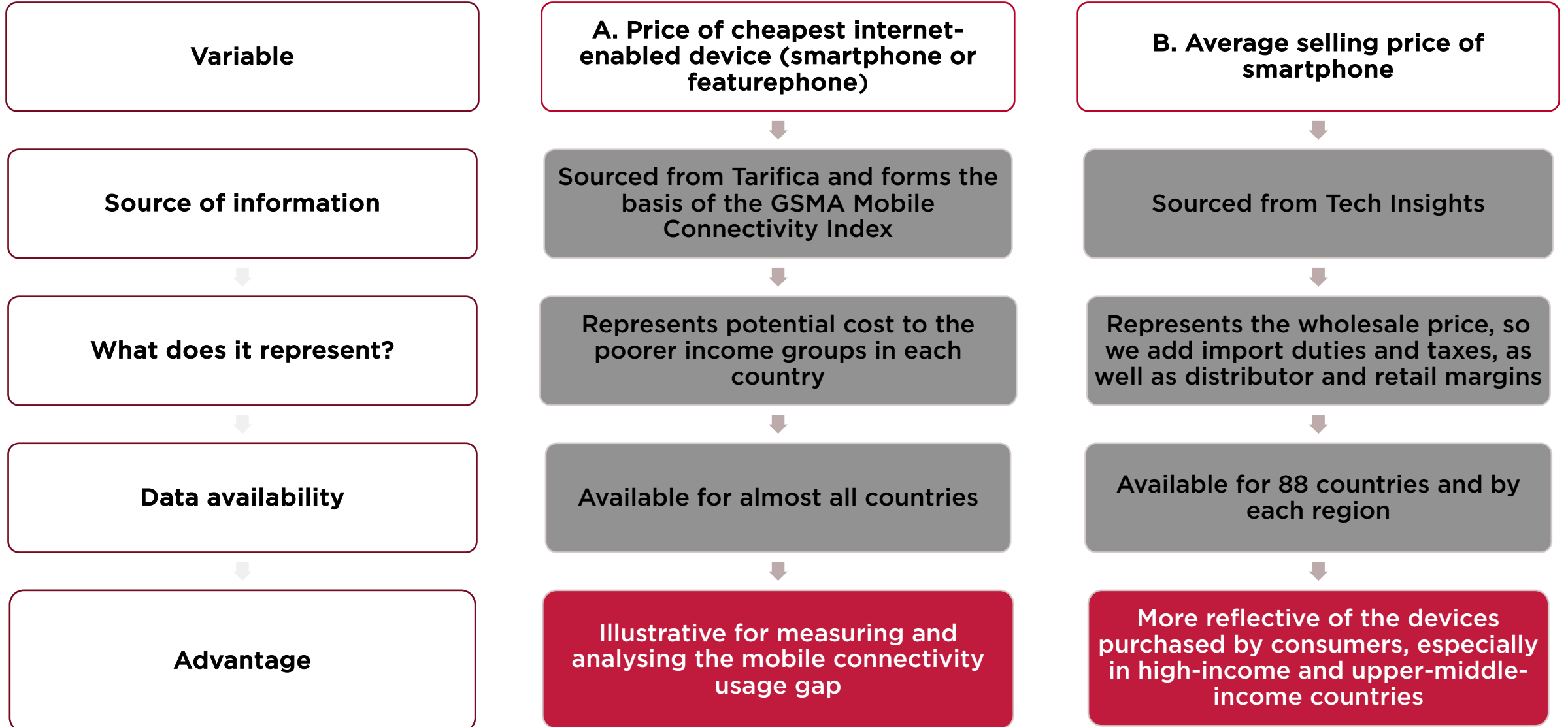
## Approach 1

- Focus on ability to pay
- High smartphone and mobile internet adoption countries for relevant affordability benchmarks
- Comparison of average handset price to average monthly income
- Comparison of monthly incomes for the 'middle 20%' and the poorest 20%

## Approach 2

- Analysis of mobile-data to device cost ratio
- Focus on entry-level data and devices
- Determination of an affordability threshold for devices
- Incorporation of the ITU target on mobile data (2% of monthly income)

# Data Sources



# Defining Affordability Target for Devices

- Affordability Target:** The percentage of monthly income at which a smartphone is considered affordable for the population. This is the relative price comparing the cost of the device to monthly income.
  - Higher Target:** Allows people to spend a larger portion of their income on a smartphone, making the threshold more flexible.
  - Lower Target:** Represents a more restrictive scenario, as people have less disposable income for device access.
- Analysis of countries with high smartphone adoption (above 60%, 70% and 80%) suggests devices have been affordable at between 15-20% of monthly income.

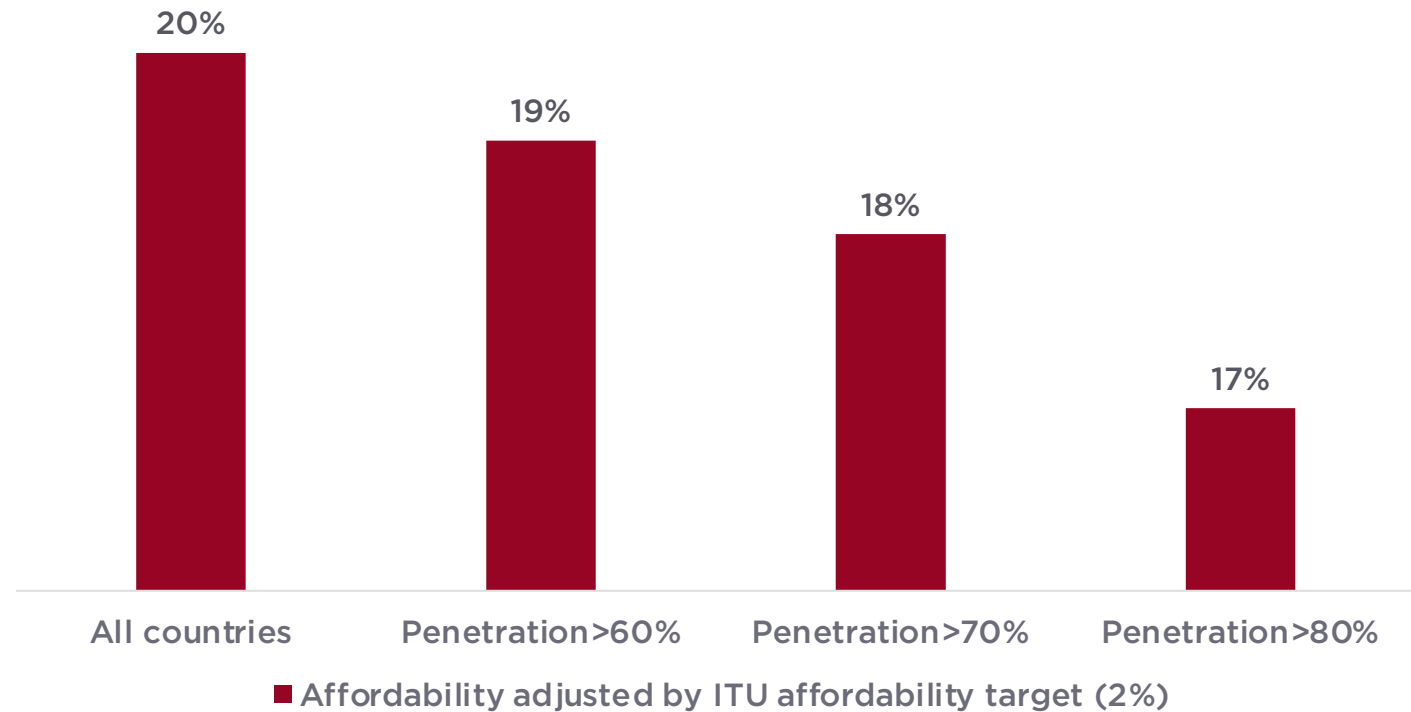
	Number of countries	Affordability of average smartphone (all)	Affordability of average smartphone (middle 20%)	Affordability of average smartphone (poorest 20%)	Affordability of entry-level device (poorest 20%)
Adoption >60%	66	16%	19%	45%	8%
Adoption >70%	47	15%	17%	39%	7%
Adoption >80%	28	14%	16%	39%	6%

**This suggests a threshold between 15-20%.**

**Average smartphone likely too high but entry-level is likely to be a very strict threshold given very few device sales have been below \$100 in high-adoption markets**

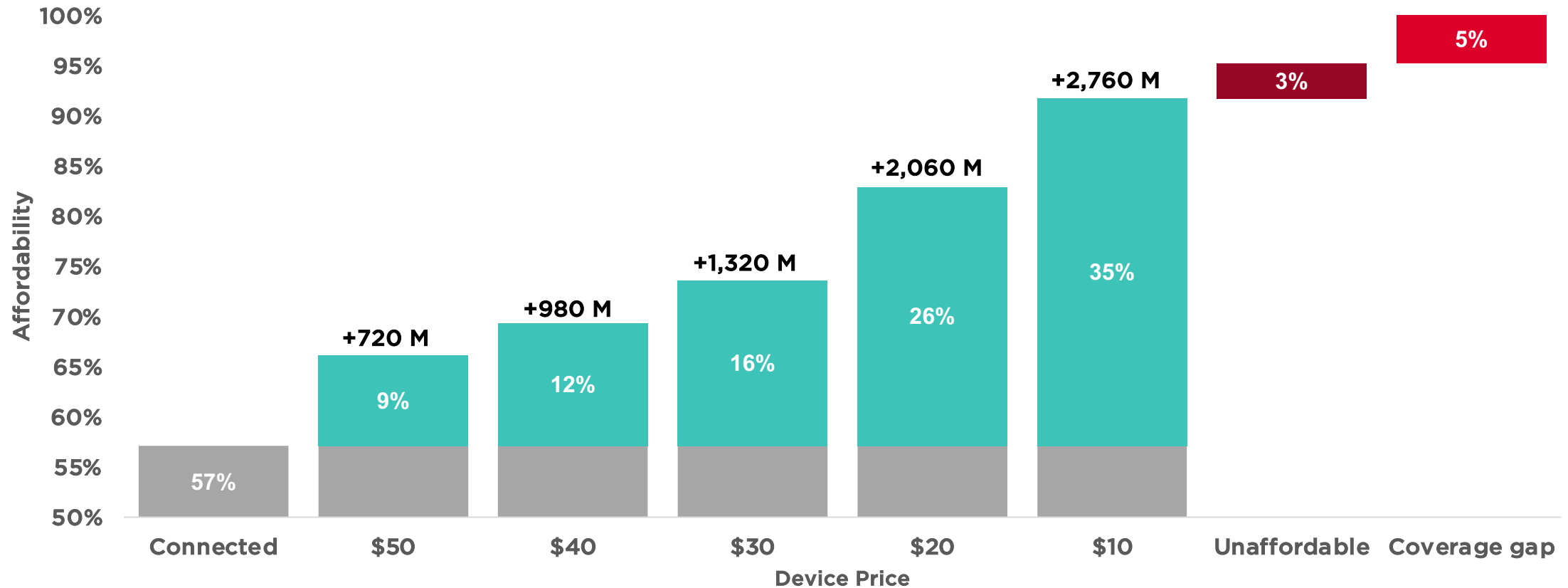
# Adjusted entry device affordability based on data cost and targets

- When considering adjustments for affordability based aspirational targets for the cost of entry-level mobile broadband, the analysis consistently indicates an affordability range between 15% and 20%
- With these adjustments, there are no significant differences in affordability thresholds between levels of smartphone penetration

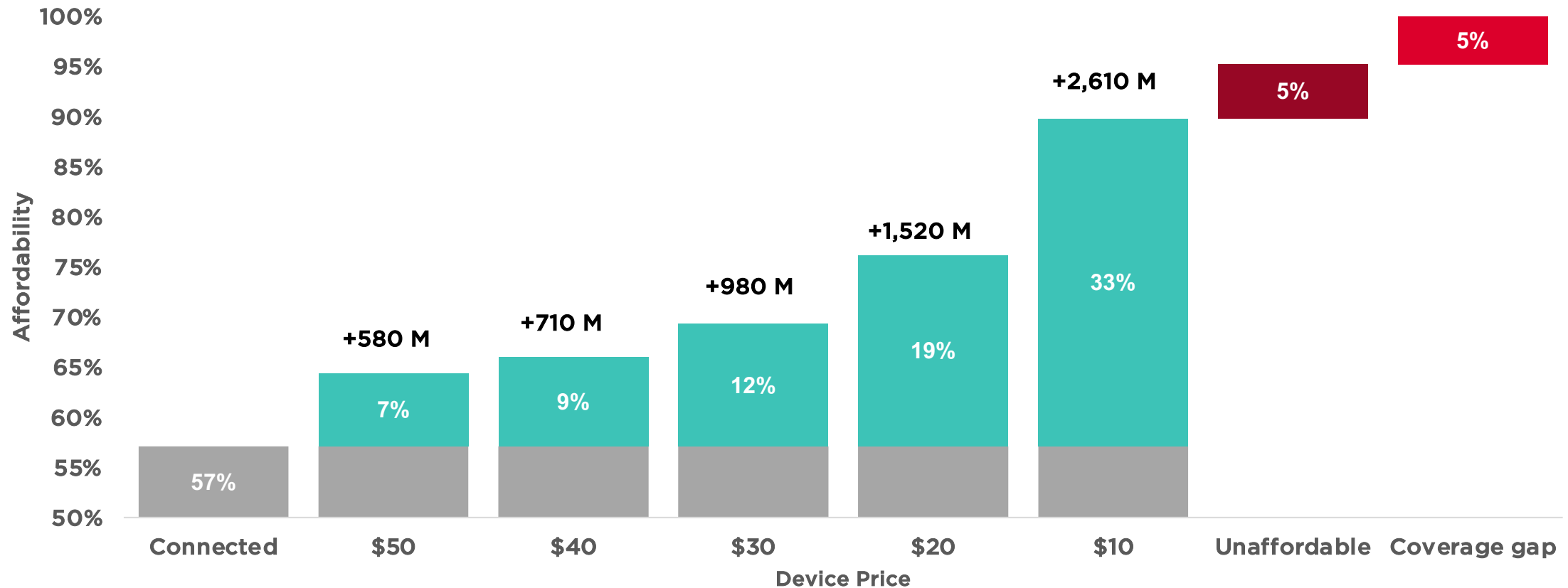


Source GSMA Intelligence estimates 2023

# Potential impact of a reduction in device prices on mobile connectivity - Affordability target of 20%



# Potential impact of a reduction in device prices on mobile connectivity - Affordability target of 15%





# Key recommendations: Addressing smartphone gaps for universal mobile internet adoption

1

Countries with higher smartphone adoption have a device affordability range of 15-20% of monthly GDP per capita. If we apply these targets, the biggest reduction in the usage gap occurs at the \$20 price point.

2

To reduce the cost of handsets, governments should remove import duties and sector-specific taxes, which can increase the cost of a device by up to 30%.

3

The affordability barrier is not just about the cost of purchasing a handset. It is also impacted by other factors such as willingness to pay, awareness, digital skills, access to financing, social norms, among others.

4

Innovative device financing schemes by public and private organisations should be scaled. In addition, devices must consider consumer needs, preferences, and perceived value to increase willingness to pay.