## 7.2.1. Rationale and definition

SDG 9 is about industry, innovation and infrastructure, the goal being to build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. Target 9.c is to significantly increase access to ICT and to provide universal and affordable access to the Internet.\[1\] It is especially important for developing countries, but mobile network coverage using different technologies is relevant for all countries, as a new generation of mobile networks emerges every decade.

While 2G (narrowband) mobile-cellular networks offer limited (mainly voice-based) services, 3G and LTE networks provide increasingly high-speed, reliable, and high-quality access to the Internet and its growing amount of information, content, services, and applications. Hence, mobile networks are essential to overcoming infrastructure barriers and helping people join the information society and benefit from the potential of ICTs, particularly in least developed countries.

The percentage of the population covered by a mobile-cellular network can be considered a minimum indicator for ICT access since it provides people with the possibility to subscribe to and use mobile-cellular services to communicate. Over the last decade, mobile-cellular networks have expanded rapidly and helped overcome very basic infrastructure barriers that existed when fixed-telephone networks – often limited to urban and highly populated areas – were the dominant telecommunication infrastructure.

SDG Indicator 9.c.1 highlights the importance of mobile networks in providing basic as well as advanced communication services and will help design targeted policies to overcome remaining infrastructure barriers and address the digital divide. Many governments track this indicator and have set specific targets in terms of the mobile population coverage (by technology) that operators must achieve.

This indicator is important for measuring regional differences to ICT access. It compares countries in terms of speed of mobile network development and enables measurements of the urban/rural and regional divides. It also links back to the methodological guide, which introduced indicator BD02: percentage of the population covered by a mobile-cellular network, by technology. This indicator is a top priority for ITU and should be calculated as one of the first ICT-related indicators. To complement the existing guidance, this Handbook demonstrates how it can be calculated without having access to MNO data and using the publicly available data sources.

### Definition

| Indicator 9.c.1, broken down by technology, refers to the percentage of inhabitants living within range of a mobile-cellular signal, irrespective of whether or not they are mobile phone subscribers or users. It is calculated by dividing the number of inhabitants within range of a mobile-cellular signal by the total population and multiplying by 100.\[6\] |

### Concepts

- The indicator is based on where the population lives, not where it works or goes to school, etc. When there are multiple operators offering the service, the maximum population number covered should be reported. Coverage should refer to LTE, broadband (3G) and narrowband (2G) mobile-cellular technologies and include the following:
  - 2G mobile population coverage: Mobile networks with access to data communications (e.g. Internet) at downstream speeds below 256 Kbit/s. This includes mobile-cellular technologies such as GPRS, CDMA2000 1x and most EDGE implementations. The indicator refers to the theoretical ability of subscribers to use non-broadband-speed mobile data services, rather than the number of active users of such services.
  - 3G population coverage: This refers to the percentage of inhabitants that are within range of at least a 3G mobile-cellular signal, irrespective of whether or not they are subscribers. This is calculated by dividing the number of inhabitants that are covered by at least a 3G mobile-cellular signal by the total population and multiplying by 100. It excludes people covered only by GPRS, EDGE or CDMA 1xRTT.
  - 4G/LTE population coverage: This refers to the percentage of inhabitants that live within range of LTE/LTE-Advanced, mobile WiMAX/WirelessMAN or other more advanced mobile-cellular networks, irrespective of whether or not they are subscribers. This is calculated by dividing the number of inhabitants that are covered by the previously mentioned mobile-cellular technologies by the total population and multiplying by 100. It excludes people covered only by HSPA, UMTS, EV-DO and previous 3G technologies, and excludes fixed WiMAX coverage.

As technologies evolve and as more and more countries deploy and commercialize more advanced mobile-broadband networks (5G, etc.), the indicator will include further breakdowns.

### Reason for calculation

The proportion of the population covered by mobile networks by technology is an important indicator to assess the opportunity for citizens to connect to the Internet. Using open-source data to estimate population coverage is useful to estimate population coverage in countries where this information is not available and to allow regional and local granularity of mobile coverage.