

4 Telecoms and networks

4.1 Recent developments in Wales

Superfast Cymru

Superfast Cymru aims to boost the commercial roll-out of fibre broadband by providing access to fibre broadband in areas where the private sector has no plans to invest. The project is funded by the Welsh government, the UK government, the European Regional Development Fund and BT. Superfast Cymru began roll-out in 2013, and by March 2015 the project had made fibre broadband available to more than 425,000 premises, with work under way in all 22 Welsh unitary authorities. Further to the Superfast Cymru programme, an infill project is in development, to ensure that all homes and businesses across Wales have access to fibre broadband.

The Superfast Cymru Infill Project will bring fast fibre broadband to areas not covered by either Superfast Cymru or by telecommunications companies' own fast fibre programmes. Following a review of suppliers' current and proposed plans for broadband, and a consultation, the Welsh government has identified 45,887 premises that are not in the scope of Superfast Cymru or any commercial roll-out planned within the next three years.

The project will ensure that all premises in Wales have access to superfast broadband, and will have two phases. The first will provide broadband to the majority of the 45,887 premises now identified, while the second will begin once the Superfast Cymru project and phase 1 of the infill project have finished, and will provide broadband to any premises still without it.

The Access Broadband Cymru scheme complements the roll-out of the Superfast Cymru programme. This scheme is available to enterprises, residents, third-sector organisations, and communities which cannot achieve broadband speeds of 2Mbit/s and above, by supporting them to obtain a broadband connection using the most appropriate technology. The project ensures that customers receive a fast broadband connection, as the technology used needs to be capable of providing superfast speeds, aligning closely with Superfast Cymru.

The Welsh Government is also providing businesses with resources to better understand how to exploit superfast broadband for economic gains.

The Auditor General for Wales reported in May that the Welsh government's Superfast Cymru contract is "making reasonable progress" in rolling out access to next generation broadband services. The report found that despite the constraint of having only one final bidder, the contract in place between the Welsh government and BT includes appropriate controls to manage costs and delivery, and that the contractual costs are within the range of other UK public sector next-generation broadband contracts with BT.

The report also says that access had been made available to just over half of the target premises by the end of 2014, and although many of the difficult-to-connect premises still remain unconnected, the improvement in delivery since early 2014 provides some confidence that the overall coverage targets will be met. The report also found that:

- there were initial weaknesses in the programme and project management, but the Welsh government now has clear and appropriate arrangements in place;

- some local authorities, businesses and residents have not been satisfied with the communication about the Superfast Cymru rollout;
- take-up of next generation broadband is rising, but there are no take-up targets in place;
- the Superfast Cymru contract has already achieved most of the expected direct benefits related to jobs, apprenticeships and work experience opportunities; and
- although arrangements to support and measure the wider benefits of the public investment in digital infrastructure have been weak, the Welsh government is now developing a national project for the exploitation by businesses of next generation broadband, and a plan for public sector exploitation.

The report makes a number of recommendations, including:

- improving communication about the local roll-out of Superfast Cymru;
- that 40% of premises in the intervention area are capable of receiving download speeds of 100Mbit/s or more; and
- supporting the take-up of next generation broadband and improving the delivery of the full benefits of the public investment.

Ultrafast Connectivity Voucher Scheme

In November 2014, the Welsh government launched the Ultrafast Connectivity Voucher Scheme. 'Ultrafast broadband' is defined as at least 100Mbit/s download speed and at least 30Mbit/s upload speed, with little or no contention. The Ultrafast Connectivity Voucher Scheme offers Welsh government-funded grants of up to £10,000 and is available to businesses based within most of Wales' Enterprise Zones and Local Growth Zones.

Cardiff Internet Exchange

The Cardiff Internet Exchange (known as IX Cardiff) was launched in October 2014 and allows businesses in Wales to decrease their reliance on connectivity to London. IX Cardiff has come about as a result of collaboration between the public and private sector: it is operated by the UK's largest IX operator, Linx, which has a strategy for establishing regional internet exchanges across the UK, and DCMS funding was used to stimulate demand, by funding routers for companies wishing to peer on the internet exchange, which is now the second largest, and fastest-growing, exchange outside London.

Super Connected Cities

The Super Connected Cardiff Programme, funded by the Department for Culture Media & Sport, was completed on 31 March 2015 and delivered a number of projects over its three-year duration. Free outdoor public WiFi (CardiffStreetWiFi) was delivered under a concession contract to Cardiff city centre in 2013 and extended to Cardiff Bay in 2014. Further coverage in the city centre is planned for late 2015.

Free in-building public WiFi (CardiffFreeWiFi) has been delivered to 150 public buildings across the city. The public WiFi was delivered to Cardiff Council buildings, charities, community halls attached to places of worship, and health centres. Later in 2015 CardiffFreeWiFi and CardiffStreetWiFi will be merged, enabling a contiguous network between in-building and outdoor WiFi, and an easier registration process between the two

networks. Public Transport WiFi (CardiffFreeWiFi) has been rolled out to 222 buses and two public education vehicles that operate in the City. The solution has also been deployed in Newport, with passengers receiving a seamless service across the region.

The Connection Voucher Scheme is a national scheme monitored and promoted by DCMS. The Cardiff Scheme has been operational since August 2013, and provides capital funding (between £100 and £3,000) for the installation of superfast connectivity to businesses, sole traders, charities and social enterprises. The scheme has been extended to March 2016, and is now available to applicants in Swansea, Neath Port Talbot, Pembrokeshire, Carmarthenshire, Bridgend, Powys, Rhondda Cynon Taff, Merthyr Tydfil, Caerphilly and the Vale of Glamorgan.

Spectrum Internet

The Welsh internet service provider, Spectrum Internet, has been active on the Connection Voucher Scheme since its beginning, and has used innovative ways to bring superfast broadband to areas in need. The ISP has deployed dark fibre to bring FTTP services to multi-tenant office buildings in Cardiff, Treforest and Bridgend.

There are now approximately 150 businesses benefiting in these three locations. Spectrum has installed its own FTTC solution in Cardiff Gate International Business Park, supplying broadband speeds of up to 80Mbit/s to SMEs located there. In the rural setting, Spectrum has further developed its network in Monmouthshire and has introduced the method of micro-trenching to deploy dark fibre. Its pilot project for this was for Shirenewton Primary School, which now benefits from a 100Mbit/s FTTP service.

4.2 Availability of fixed broadband services

Almost all UK premises are able to receive basic broadband services

There are three key technologies that are used to provide fixed broadband services in the UK: exchange-based ADSL, cable (over a hybrid fibre-coaxial network), and fibre-to-the-cabinet (using VDSL in the street cabinet).³¹ ADSL transmits data over the existing copper network, and is the cheapest of these technologies to deploy, as in most cases, it does not require an upgrade to the existing telephone network, other than new equipment in the local exchange (cable and fibre rollout both involve the deployment of new infrastructure to connect local exchanges/nodes to the end-user).

However, while ADSL technology has the benefit of being comparatively cheap to roll-out, it is unable to provide the superfast speeds³² of cable and fibre, and some premises in ADSL-enabled areas may not be able to receive service, or may only be able to do so at very low speeds of as a result of the long length, or poor quality, of the telephone line from their premises to the local exchange.

By the end of 2014, almost all of BT's local exchanges (of which there are around 5,600 across the UK) had been upgraded to offer ADSL broadband services and, across the UK as a whole, the proportion of premises (i.e. homes and offices) that were connected to an ADSL-enabled exchange was over 99.9% (Figure 4.1). In Northern Ireland and Wales, all the BT local exchanges have been upgraded to offer ADSL broadband services, while in England and Scotland there remain exchanges that are not ADSL-enabled, and the proportions of premises connected to ADSL-enabled exchanges is slightly lower.

³¹ A small proportion of premises is also served by fibre-to-the-premises (FTTP).

³² i.e. actual speeds of 'up to' 30Mbit/s or higher

Local-loop unbundling (LLU) involves an alternative provider offering broadband services over the twisted copper pair from the local exchange to the end user's premises, which is leased from the incumbent provider. To do this, the LLU provider has to site its own equipment in the incumbent's local exchange and connect it to its own backhaul network. The advantage of LLU to ISPs is that it allows them to benefit from the economies of scale that are not available when purchasing wholesale services from the incumbent on a per-connection basis, and it also enables them to differentiate their retail products from those offered by their competitors. The deployment of LLU ADSL services in the UK has resulted in the availability of low-cost bundled broadband services to consumers living in unbundled exchange areas.

By the end of 2014, LLU availability in the UK was high, with 95% of premises being in areas served by unbundled local exchanges (an increase of just 0.2 percentage points compared to the previous year). Roll-out of any fixed telecoms network tends, initially at least, to be concentrated in urban areas (where there are a larger number of premises to be served) and this is reflected in the fact that the proportion of premises in urban areas that were connected to an unbundled local exchange at the end of 2014 (over 99.9%) was higher than in rural areas (77%). Wales had the second highest proportion of premises that were connected to an unbundled local exchange at the end of 2014, at 93%. Among the other UK nations, this proportion ranged from 89% in Scotland and Northern Ireland to 96% in England.

Figure 4.1 Proportion of premises connected to ADSL-enabled and unbundled exchanges



Source: Ofcom / BT, December 2014 data

Wales had the lowest proportion of premises that could receive cable broadband services (21%) across the UK nations in May 2015

Ofcom collects data showing the number of UK premises that are able to receive cable and fibre broadband services as part of its work to monitor the UK's communications market infrastructure. It is important to note that not all cable and fibre broadband connections are capable of providing superfast broadband services (i.e. those with an actual speed of 30Mbit/s or higher). For example, the speed achievable on a fibre-to-the-cabinet (FTTC) line will depend on the length and quality of the copper connection from the street cabinet to the user's premises, as is the case with ADSL (these limitations do not apply to cable and fibre-

to-the-premises services). Ofcom's 2015 Communications Infrastructure Report Update³³ will provide more detailed analysis of the distribution of fixed broadband speeds.

Urban and rural classifications

In previous Communications Market Reports, Ofcom has used a third-party data source (*Locale*) to classify postcodes as being urban or rural. This year, that data source was not available, so Ofcom has used the rural/urban classifications developed by DEFRA, NISRA and The Scottish Registry Office to produce urban/rural splits. Analysis shows that at an urban/rural split level, the two datasets correspond 95% of the time where postcodes can be matched. However, each dataset cannot match 2.5% of all postcodes, and the unallocated postcodes differ between datasets. Therefore, the urban/rural classification of between 5% and 10% of postcodes varies between datasets, and the urban/rural figures in this report are not directly comparable to those in previous reports.

Data provided to Ofcom by Virgin Media show that 44% of UK premises were able to receive cable broadband services over Virgin Media's network in May 2015, unchanged from June 2014 (0). Wales had the lowest proportion of premises that could receive Virgin Media cable services (which offer advertised download speeds of 'up to' 50Mbit/s, 100Mbit/s and 152Mbit/s) in May 2015, at 21%: across the other UK nations the proportion of premises able to receive cable broadband ranged from 27% in Northern Ireland to 47% in England. The proportion of premises able to receive Virgin Media cable broadband services was significantly higher in urban areas of the UK (50%) than in rural areas (1%).

Figure 4.2 Proportion of premises able to receive Virgin Media cable broadband services



Source: Ofcom / Virgin Media, May 2015 data

Wales had the second highest proportion of premises that could receive fibre broadband services among the UK nations in May 2015

We have calculated the proportion of premises able to receive fibre broadband services using data provided by Openreach (a BT Group company) and Kcom (the incumbent provider in the Kingston-upon-Hull area).³⁴ As stated previously, it is important to note that

³³ Due to be published in Q4 2015

³⁴ Under regulatory rules other providers can provide retail fibre broadband services to consumers using these networks.

not all fibre broadband connections will be able to achieve actual download speeds of 30Mbit/s.

Our analysis shows that by May 2015 82%³⁵ of UK premises were able to receive fibre broadband services over Openreach or Kcom's fibre broadband networks, a 13 percentage point increase compared to June 2014 (Figure 4.3). Wales had the second highest proportion of premises that could receive fibre broadband services in May 2015 (83%), a 28 percentage point increase compared to May 2014, the highest such increase among the UK nations.

Among the other nations, the proportion of premises that were served by Openreach or Kcom's fibre broadband networks ranged from 75% in Scotland to 92% in Northern Ireland, which has benefited from a Department of Enterprise, Trade and Investment (DETI) initiative to increase the availability of superfast broadband services. As was the case with cable services, the availability of fibre broadband services was higher in urban areas of the UK than in rural areas, with 84% of premises in urban areas being able to receive Openreach or Kcom's fibre broadband services, compared to 67% in rural areas.

Again, it is important to note than not all fibre broadband connections will be able to achieve actual downstream speeds of 30Mbit/s.

Figure 4.3 Proportion of premises able to receive Openreach / Kcom fibre broadband services



Source: Ofcom / Openreach / Kcom, May 2015 data

By May 2015, 87% of premises in Wales could receive next generation access broadband services

We are able to estimate the proportion of premises that are served by next generation access (NGA) networks (which are used to deliver superfast broadband services) by combining the Virgin Media cable broadband availability data shown in 0 with the Openreach/Kcom fibre broadband availability data shown in Figure 4.3.

Combining postcode-level availability data for cable and fibre services gives us a range of availability for NGA broadband services: for example, if cable broadband and fibre broadband services are both available to 50% of premises in a postcode, the availability of

³⁵ It should be noted that this figure, and those given below, will understate actual fibre broadband availability as they exclude availability over networks other than Openreach and Kcom's.

NGA services in that postcode will be somewhere between 50% of premises (where cable and fibre services are available to the same premises within the postcode area) to 100% of premises (where there is no overlap in the availability of cable and fibre services). In Figure 4.4 below, we show the mean of the possible range of availability of NGA services, which would be 75% in the example given above.

Our analysis indicates that 90% of UK premises were able to receive fixed broadband services over NGA networks by May 2015, a 12 percentage point increase compared to June 2014. Wales had the second lowest availability of NGA broadband networks in May 2015, with 87% of premises having access to NGA services. However, this was a 29 percentage point increase June 2014, the largest increase recorded among the nations over this period. Across the other UK nations, the proportion of premises that could receive NGA broadband services ranged from 85% in Scotland to 95% in Northern Ireland, with 90% of premises in England being within NGA network footprints. In urban areas of the UK, 92% of premises were able to receive NGA broadband services in May 2015, compared to 67% in rural areas.

Figure 4.4 Proportion of premises able to receive NGA broadband services



Source: Ofcom / Openreach / Virgin Media / Kcom, May 2015 data

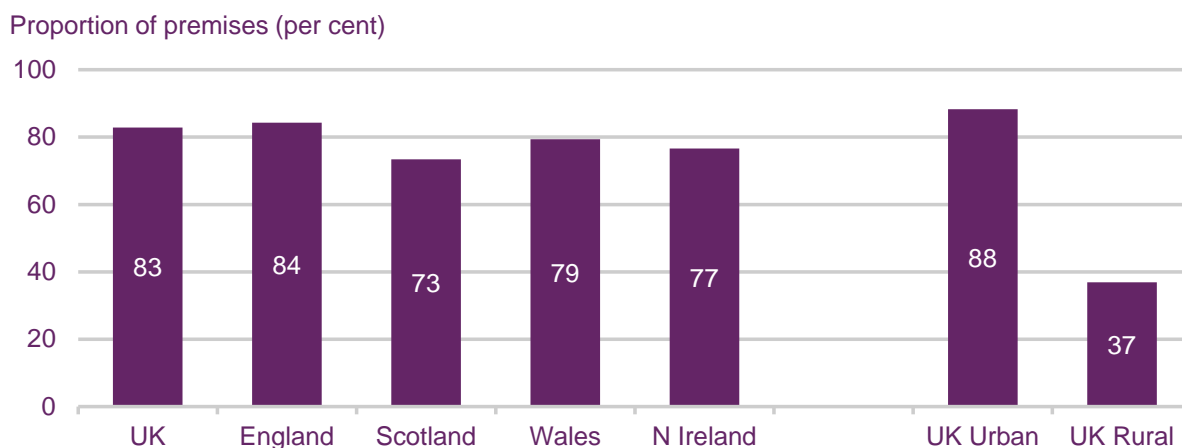
Seventy-nine per cent of premises in Wales were able to receive superfast broadband services in May 2015

As mentioned previously, not all NGA broadband connections are capable of providing superfast broadband services (i.e. those with an actual speed of 30Mbit/s or higher) and, in particular, the speed achievable over an FTTC connection will depend on the length and quality of the copper connection from the street cabinet to the user's premises. In collecting data to inform its work monitoring the UK's communications market infrastructure in 2015, Ofcom asked Virgin Media, Openreach and Kcom to provide postcode-level data regarding the proportion of premises that could receive superfast broadband services, i.e. a fixed broadband service with an actual speed of 30Mbit/s or higher.

As is shown in Figure 4.5 below, these data suggest that while 90% of UK premises were able to receive NGA broadband services in May 2015, the proportion that was able to receive superfast broadband services was seven percentage points lower, at 83%. While 87% of premises in Wales could receive NGA broadband in May 2015, the second lowest proportion among the UK nations, Wales had the second highest proportion that could receive superfast broadband services (79%). This means that 8% of premises in Wales were in areas where NGA broadband was available but were unable to receive actual broadband speeds of 30Mbit/s; the second lowest proportion across the UK nations, after England (6%).

Among the other UK nations, the proportion of premises that could receive superfast broadband services ranged from 73% in Scotland to 84% in England (in Northern Ireland it was 77%). The proportion of premises that could receive superfast broadband services in urban areas of the UK (88%) was significantly higher than in rural areas (37%). This indicates that while, across the UK as a whole, 7% of premises in NGA areas could not receive an actual fixed broadband download speed of 30Mbit/s, the proportion was much higher in rural areas (45%) than in urban areas (4%).

Figure 4.5 Proportion of premises able to receive superfast broadband services



Source: Ofcom / Openreach / Virgin Media / Kcom, May 2015 data

4.3 Mobile network coverage

Overview

How we measure the availability of mobile telephony for this report

The coverage information presented in Ofcom's *Communications Market Reports* and *Infrastructure Report* is collected by Ofcom from the four UK mobile network operators (MNOs). Information on coverage is provided by each operator for each 100x100m pixel of landmass across the UK. This information is correlated with maps of premises to give the premises' coverage figures.

The availability figures quoted all refer to outdoor coverage. Coverage figures for indoor reception are likely to be lower, because radio signals are attenuated as they pass through the fabric of buildings. Indoor reception is highly dependent on the building in which reception is desired, and where the user is located in the building, making it difficult to calculate accurate indoor coverage figures.

Figure 4.6, Figure 4.7 and Figure 4.8 show coverage levels for 2G, 3G and 4G mobile services respectively.³⁶ 2G is considered satisfactory for telephone calls and text messaging, while 3G is considered the minimum necessary to provide an acceptable experience of accessing mobile data services. 4G generally provides a better user experience than 3G when accessing mobile data services, as a result of the faster data speeds that it offers.

³⁶ The availability data provided by the MNOs is taken from network planning tools, which are subject to a margin of error, and local factors such as tall buildings or trees can affect signal strength.

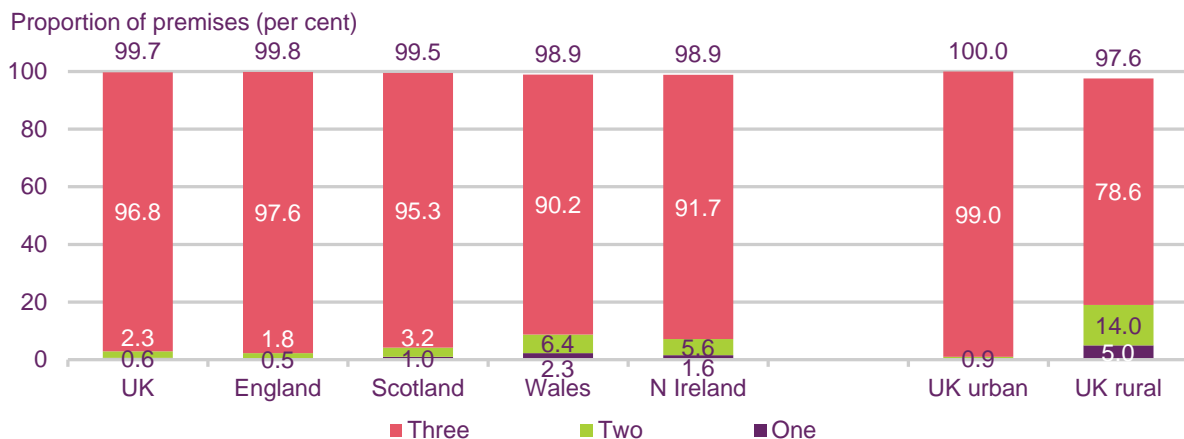
There are still areas of the UK where a lack of mobile coverage means that it is not possible to make mobile voice calls, send text messages and/or access mobile data services. These areas are known as 'mobile not-spots' and are often characterised by low population density and/or hilly terrain which present physical and economic obstacles that deter mobile network operators (MNOs) from deploying mobile network infrastructure in these areas. In other areas (known as 'partial not-spots') some operators have mobile coverage whereas others do not.

98.9% of premises in Wales were in areas with outdoor 2G coverage in May 2015

The coverage data provided to us by MNOs shows that 96.8% of UK premises had outdoor coverage from all three 2G network operators (EE, O2 and Vodafone) in May 2015 (Figure 4.6). Overall, 99.7% UK of premises were in areas where at least one mobile network provided outdoor 2G coverage, suggesting that 0.3% of UK premises (around 75,000 premises) were in areas without any 2G mobile coverage. The proportion of UK premises in areas with outdoor 2G mobile coverage was higher in urban locations (100.0%) than in rural ones (97.6%).

Wales had the lowest proportion of premises with outdoor coverage from all three 2G networks among the UK nations in May 2015, at 90.2%, while 1.1% of premises in Wales (around 15,000 premises) were in areas without 2G coverage. The lower-than-average network coverage in Wales is a reflection of its hilly terrain, which restricts the propagation of mobile signals. England had the highest 2G coverage across the UK nations, with 97.6% of premises having outdoor coverage from all three 2G networks and 0.2% being in areas without any outdoor 2G coverage.

Figure 4.6 2G premises outdoor mobile coverage, by number of operators



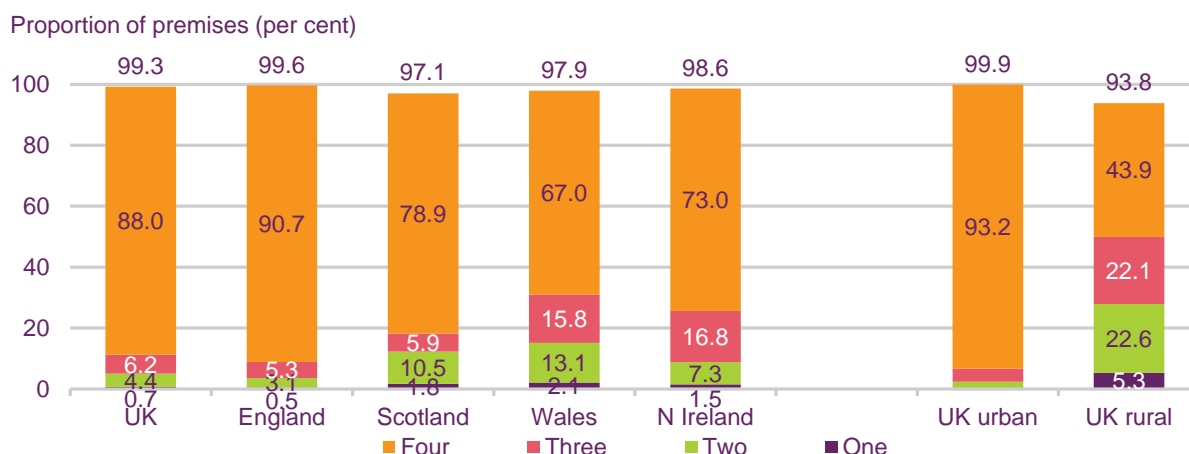
Source: Ofcom / operators, May 2015 data
 Note: Coverage is based on 100m² pixels covering the UK

Just less than 98% of premises in Wales were in areas with outdoor 3G outdoor coverage in May 2015

Our analysis suggests that 99.3% of UK premises were in areas with outdoor 3G mobile coverage in May 2015, while 88.0% were in areas with similar coverage from all four UK 3G networks (EE, O2, Vodafone and Three). Conversely, 0.7% of premises were in areas without any 3G mobile reception, equivalent to around 210,000 premises. The proportion of premises in areas with outdoor 3G coverage was higher in urban areas of the UK (99.9%) than in rural areas (93.8%).

As was the case with 2G services, the proportion of premises in areas with outdoor 3G mobile coverage was highest in England, where 99.6% of premises were in areas with coverage from at least one 3G network, and 90.7% had coverage from all four MNOs (Figure 4.7). Wales had the second lowest proportion of premises in areas with outdoor 3G coverage from at least one MNO, among the UK nations, in May 2015, at 97.9%, 1.4 percentage points below the UK average, and also had the lowest proportion of premises with similar coverage from all four 3G networks, at 67.0%.

Figure 4.7 3G premises outdoor mobile coverage, by number of operators



Source: Ofcom / operators, June 2015 data

Note: Coverage is based on 100m² pixels covering the UK

Wales had the lowest availability of 4G services across the UK in May 2015

The UK's four national MNOs are still in the process of deploying their 4G networks. This is reflected in the fact that the availability of 4G services was lower than that of 2G and 3G services in May 2015 (Figure 4.8).

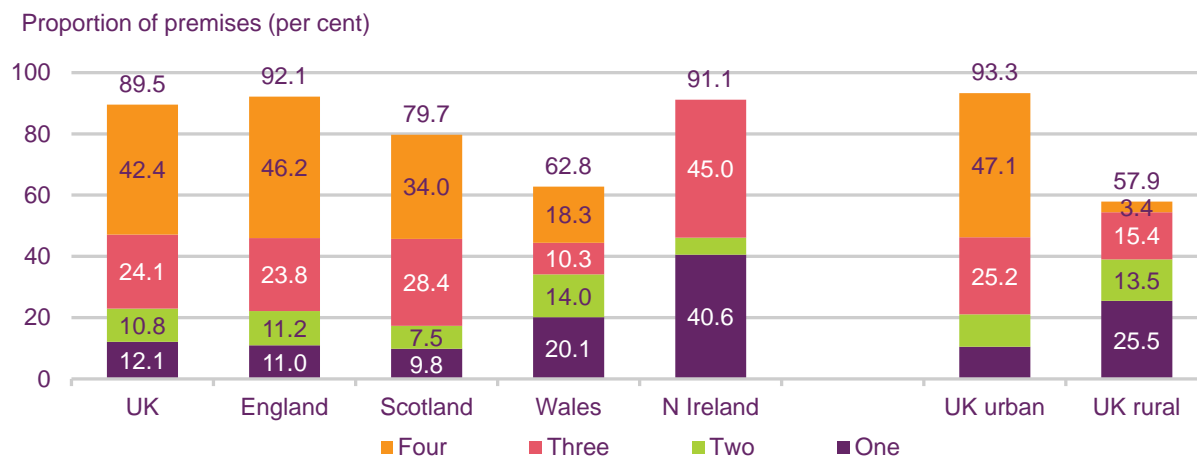
Data provided by the MNOs suggest that 89.5% of UK premises were in areas with outdoor mobile coverage from at least one 4G network in May 2015, a 17.7 percentage point increase compared to the 71.8% recorded in June 2014³⁷. All four UK MNOs aim to have at least 98% 4G population coverage by the end of 2015, and the 4G spectrum licence acquired by O2 stipulates that it should provide indoor coverage to 98% of the UK population (and at least 95% of the population of each of the UK nations) by the end of 2017 at the latest.

Wales had the lowest proportion of premises in areas with outdoor 4G network coverage from at least one 4G network in May 2015 at 62.8%. This was an 18.4 percentage point increase compared to June 2014, the second largest such increase among the UK nations. Among the other UK nations, the proportion of premises with outdoor 4G coverage ranged from 79.7% in Wales to 92.1% in England (in Northern Ireland, where Three did not offer 4G mobile services in May 2015, it was 91.1%).

³⁷ All 4G coverage comparisons between 2014 and 2015 are indicative only as coverage data for Three was not available in 2014, and 2014 figures are therefore based on three rather than four UK MNOs.

The difference between urban and rural 4G coverage was much more marked for 4G services than for 2G and 3G in May 2015, with 93.3% of urban premises having outdoor 4G coverage, compared to 57.9% of those in rural areas.

Figure 4.8 4G premises outdoor mobile coverage, by number of operators



Source: Ofcom / operators, May 2015 data
 Note: Coverage is based on 100m² pixels covering the UK

4.4 Service take-up

Take-up of communication services in Wales was in line with UK averages in Q1 2015

Take-up of landline, mobile phone and broadband services in Wales were in line with the averages for the UK as a whole in Q1 2015 (Figure 4.9). This was not the case a year previously, when landline and broadband take-up in Wales had been lower than average. In Q1 2015, adults in Wales were more likely to have a tablet computer in their household, compared to the UK overall (60% vs. 54%). There were no significant differences in any of the service and device take-up figures shown below between urban and rural areas of Wales.

Figure 4.9 Take-up of communications services: 2015

		UK	Wales	England	Scotland	N Ireland	Wales urban	Wales rural
Individual								
Voice telephony	Fixed Line	84%	83%	85%	82%	84%	82%	85%
	Mobile phone	93%	90%	93%	91%	91%	90%	89%
	Smartphone	66%	63%	67%	63%	63%	64%	59%
Internet	Computer (any type)	83%	84%	84%	75%	77%	84%	83%
	Tablet computer	54%	60%	54%	52%	54%	62%	54%
	Total Internet ¹	85%	86%	86%	78%	79%	86%	85%
	Broadband (fixed & mobile) ²	80%	78%	81%	73%	72%	77%	80%
	Fixed Broadband	78%	77%	79%	71%	69%	76%	79%
	Mobile internet ³	61%	59%	62%	59%	60%	60%	51%

Source: Ofcom Technology Tracker, wave 1 2015

Notes: ¹Households with an internet connection of any description; ²Households with a fixed broadband and/or dedicated mobile broadband (dongle/SIM) data connection (excludes households that solely use a mobile handset/s to access the internet); ³households that use a mobile handset/s to access the internet (may also have any other type of internet access).

Base: All adults aged 16+ (n = 3756 UK, 496 Wales, 2264 England, 492 Scotland, 504 Northern Ireland, 249 Wales urban, 247 Wales rural)

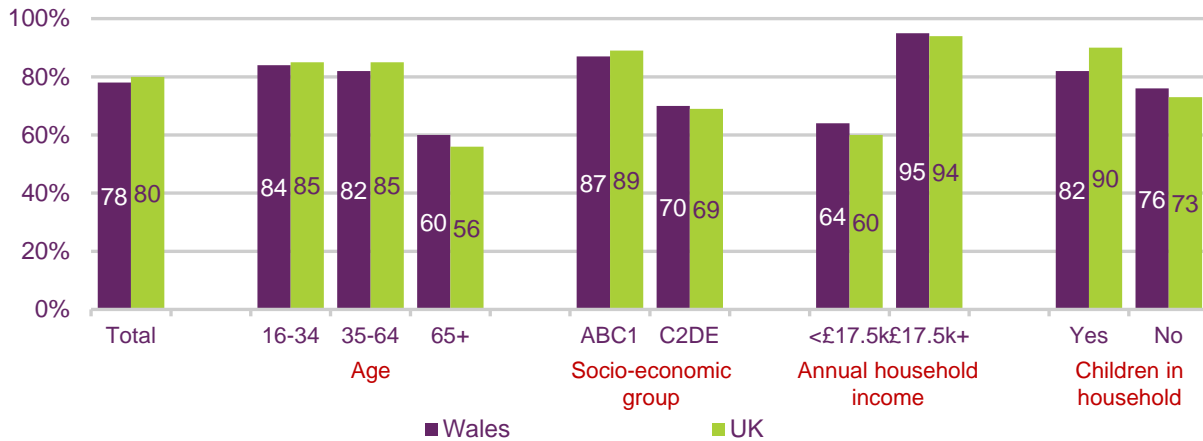
QC1. Is there a landline phone in your home that can be used to make and receive calls?/ QD2. Do you personally use a mobile phone?/ QD24B. Do you personally use a smartphone?/ QE1. Does your household have a PC or laptop computer?/ QE2. Do you or does anyone in your household have access to the internet/ World Wide Web at home?/ QE9. Which of these methods does your household use to connect to the Internet at home?/ QD28A. Which if any, of the following activities, other than making and receiving voice calls, do you use your mobile for?

Take-up of broadband, among those with children in the household, is lower in Wales than the UK average

As shown in Figure 4.10 there was no difference in consumer broadband take-up in Wales (78%) compared to the UK as a whole (80%) in Q1 2015. However, households in Wales with children were less likely to have broadband at home (82%) compared to the UK average (90%) and, unlike the UK overall, households with children in Wales were no more likely to have broadband at home, compared to those without children (82% vs. 76%).

There were differences in broadband take-up in Wales by age, socio-economic group and household income, as in the UK overall. Adults aged 65 and over were less likely to have broadband (60%) compared to 16-34s (84%) and 35-64s (82%). Broadband take-up was 17 percentage points higher among ABC1 adults in Wales (87%) compared to those in C2DE socio-economic groups (70%), and there was a 31 percentage point difference between adults in Wales with a household income below £17.5k (64%) and those with a household income above £17.5k (95%).

Figure 4.10 Consumer broadband take-up in Wales, by demographic



Source: Ofcom Technology Tracker, wave 1 2015

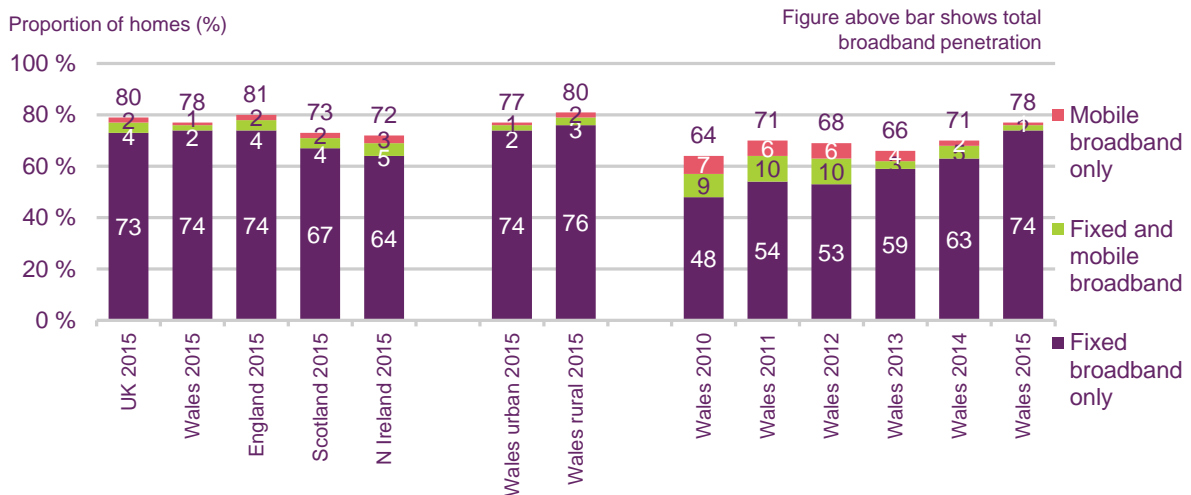
Base: All adults aged 16+ (n = 496 Wales, 128 16-34s, 242 35-64s, 126 65+, 260 ABC1, 236 C2DE, 158 <£17.5k income, 116 £17.5k+, 152 children in home, 344 no children in home)

QE9. Which of these methods does your household use to connect to the internet at home?

Total broadband penetration increased by 7pp to 78% in Wales in the year to Q1 2015

The proportion of households in Wales using solely a fixed broadband service in Q1 2015 was in line with the rest of the UK (74% and 73% respectively); this was an 11pp increase (63%) on the level in Q1 2014 (Figure 4.11). The rise in the number in fixed broadband-only homes in Wales has driven the increase in total broadband penetration, which has increased by 7pp; from 71% to 78% since Q1 2014. There has been a decrease in the proportion of households using both fixed and mobile broadband, from 5% in Q1 2014 to 2% in Q1 2015.

Figure 4.11 Consumer broadband take-up, by connection type



Source: Ofcom Technology Tracker, wave 1 2015

Base: All adults aged 16+ (n = 3756 UK, 496 Wales, 2264 England, 492 Scotland, 504 Northern Ireland, 249 Wales urban, 247 Wales rural, 1075 Wales 2010, 493 Wales 2011, 513 Wales 2012, 492 Wales 2013, 491 Wales 2014, 496 Wales 2015)

QE9. Which of these methods does your household use to connect to the internet at home?

A majority of adults in Wales have been online using their mobile phone in the previous week

Six in ten adults in Wales (59%) said they had used their mobile phone to access the internet in Q1 2015, with almost all of these (89%) saying they had done so in the previous week (Figure 4.12). These figures were in line with those for the UK as a whole, and unchanged since Q1 2014.

Figure 4.12 Proportion of adults who have used a mobile phone to access the internet



Source: Ofcom Technology Tracker, wave 1 2015

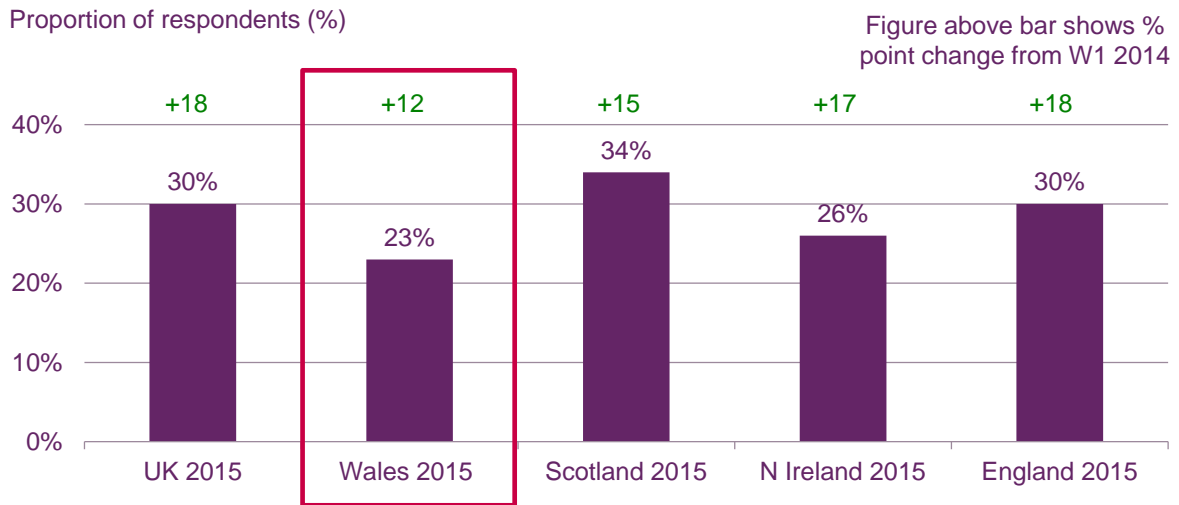
Base: All adults aged 16+ (n = 3756 UK, 496 Wales, 2264 England, 492 Scotland, 504 Northern Ireland, 249 Wales urban, 247 Wales rural, 1075 Wales 2010, 493 Wales 2011, 513 Wales 2012, 492 Wales 2013, 491 Wales 2014, 496 Wales 2015)

QD28A-B. Which, if any, of the following activities, other than making and receiving calls, do you use your mobile for?/ And which of these activities have you used your mobile for in the last week?

Just under a quarter of adults in Wales have a 4G service

As shown in Figure 4.13, just under a quarter (23%) of adults in Wales reported that they had a 4G service in Q1 2015. This was below the UK average (30%) and was the lowest proportion among the UK nations. In the year to Q1 2015 the proportion of adults in Wales with a 4G service increased by 12pp, from 11% in Q1 2014.

Figure 4.13 4G take-up, by nation



Source: Ofcom Technology Tracker, wave 1 2015

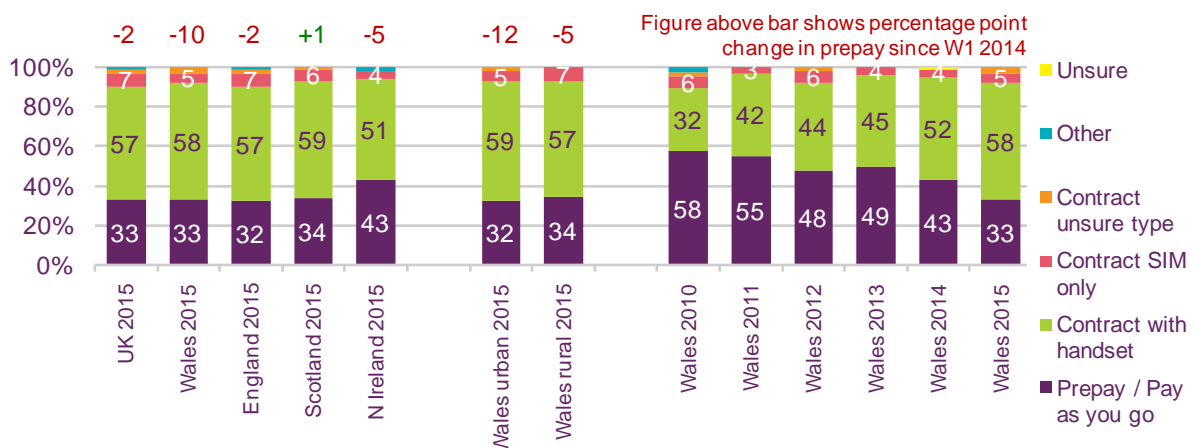
Base: All adults aged 16+ (n = 3756 UK, 438 Northern Ireland, 2264 England, 492 Scotland, 496 Wales)

QD6 (QD41). Do you have a 4G service? This is a relatively new service that enables faster mobile internet access

Take-up of pre-pay mobile services has declined since last year; the figure is now in line with the UK average

There was a ten percentage point fall, to 33%, in the proportion of mobile users in Wales who ‘most often’ used a pre-pay phone (and a corresponding 10% increase in the proportion using post-pay services) in the year to Q1 2015 (Figure 4.14). In Q1 2014, take-up of pre-pay mobile services had been higher than the UK average (35%) among adults in Wales (at 43%), but this was no longer the case in Q1 2015. The decline in pre-pay use in the year to Q1 2015 in Wales was more pronounced among mobile users in urban areas (among whom there was a 12 percentage point decrease since 2014) than among those in rural areas (where the fall was 5 percentage points).

Figure 4.14 Type of mobile subscription



Source: Ofcom Technology Tracker, wave 1 2015

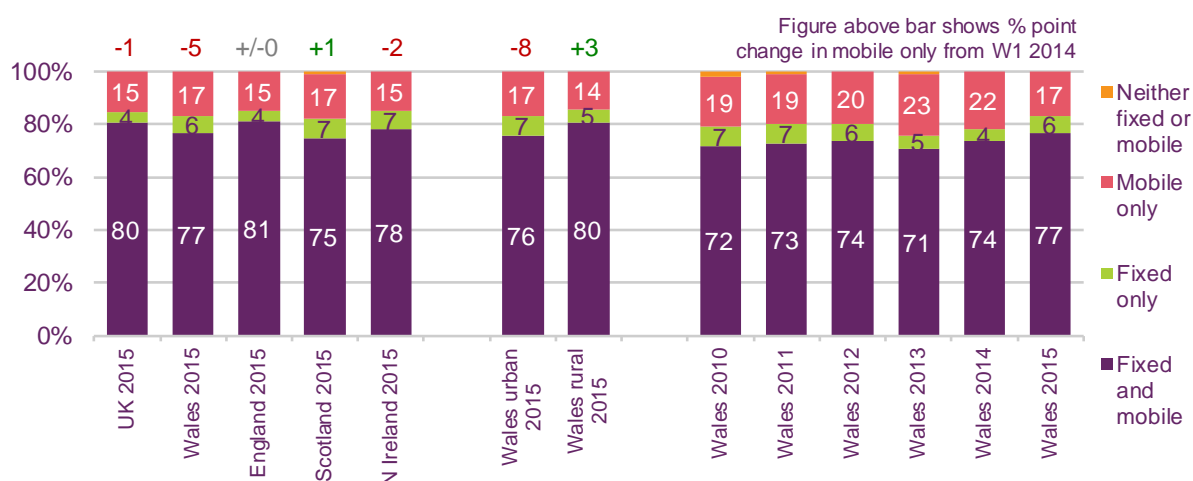
Base: Adults aged 16+ who personally use a mobile phone (n = 3425 UK, 439 Wales, 2080 England, 450 Scotland, 456 Northern Ireland, 221 Wales urban, 218 Wales rural, 923 Wales 2010, 416 Wales 2011, 456 Wales 2012, 440 Wales 2013, 438 Wales 2014, 439 Wales 2015)

QD11. Which of these best describes the mobile package you personally use most often?

The number of mobile-only households in urban Wales has decreased since 2014

Just over three-quarters (77%) of households in Wales had both fixed and mobile telephone services in Q1 2015 (Figure 4.15). Six per cent of households in Wales had access to a fixed line only, and 17% had access to a mobile phone only. Since Q1 2014 there has been a decrease in the number of mobile-only households in urban Wales, down by 8pp from 25% to 17%. This fall may be related to the increase in fixed broadband take-up, shown in Figure 4.11, as most UK homes need a landline in order to be able to receive fixed broadband.

Figure 4.15 Cross-ownership of household telephony services



Source: Ofcom Technology Tracker, wave 1 2015

Base: All adults aged 16+ (n = 3756 UK, 496 Wales, 2264 England, 492 Scotland, 504 Northern Ireland, 249 Wales urban, 247 Wales rural, 1075 Wales 2010, 493 Wales 2011, 513 Wales 2012, 492 Wales 2013, 491 Wales 2014, 496 Wales 2015)

QC1. Is there a landline phone in your home that can be used to make and receive calls?/ QD1. How many mobile phones in total do you and members of your household use?

4.5 Satisfaction with telecoms services

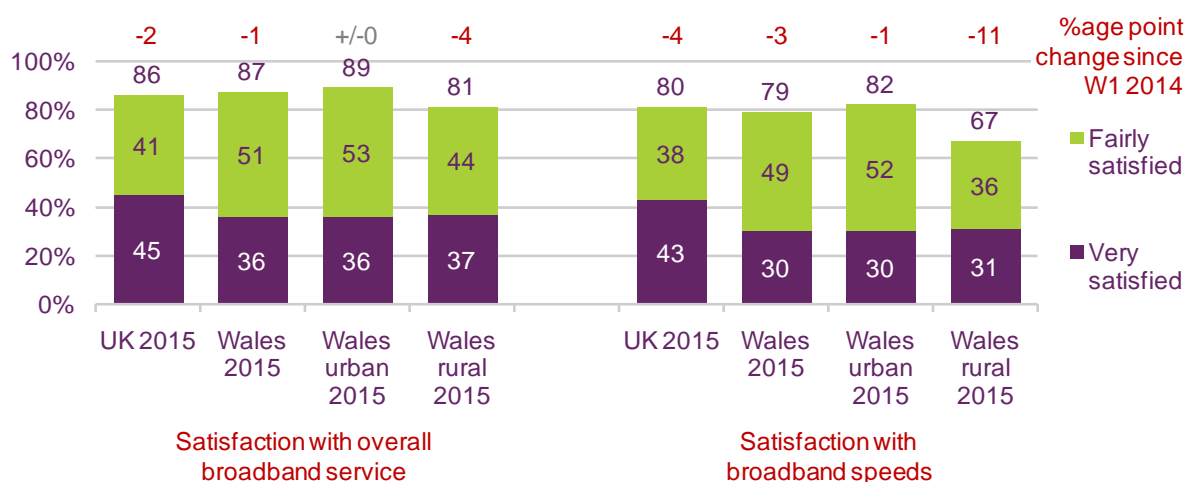
Rural internet users in Wales are less likely to be satisfied with their fixed broadband speeds

Overall, almost nine in ten broadband internet users (87%) in Wales were either 'very' or 'fairly' satisfied with their broadband service in Q1 2015 (Figure 4.16). While this figure is comparable to the UK average (86%), internet users in Wales were less likely to say they were 'very' satisfied (36% vs. 45%). There was no change in overall levels of satisfaction with fixed broadband services in Wales, or the UK overall, in the year to Q1 2015.

As was the case for the UK as a whole, internet users in Wales were less likely to be satisfied with their broadband speed (79%) than with their broadband service overall (87%). While total satisfaction with broadband speeds in Wales was comparable to the UK as a whole, internet users in Wales were less likely to be 'very' satisfied (30% vs. 43%) with this aspect of their broadband service. While satisfaction with fixed broadband speeds fell across UK broadband users as a whole in the year to Q1 2015, there was no change in satisfaction levels among users in Wales during this period.

Although there was no difference in overall satisfaction with the broadband service among internet users in Wales based on urban or rural location, urban users in Wales were more likely than rural users to say they were satisfied with their broadband speed (82% vs. 67%).

Figure 4.16 Satisfaction with overall service and speed of fixed broadband connection



Source: Ofcom Technology Tracker, wave 1 2015

Base: Adults aged 16+ with a fixed broadband connection at home (n = 2781 UK, 380 Wales, 185 Wales urban, 195 Wales rural)

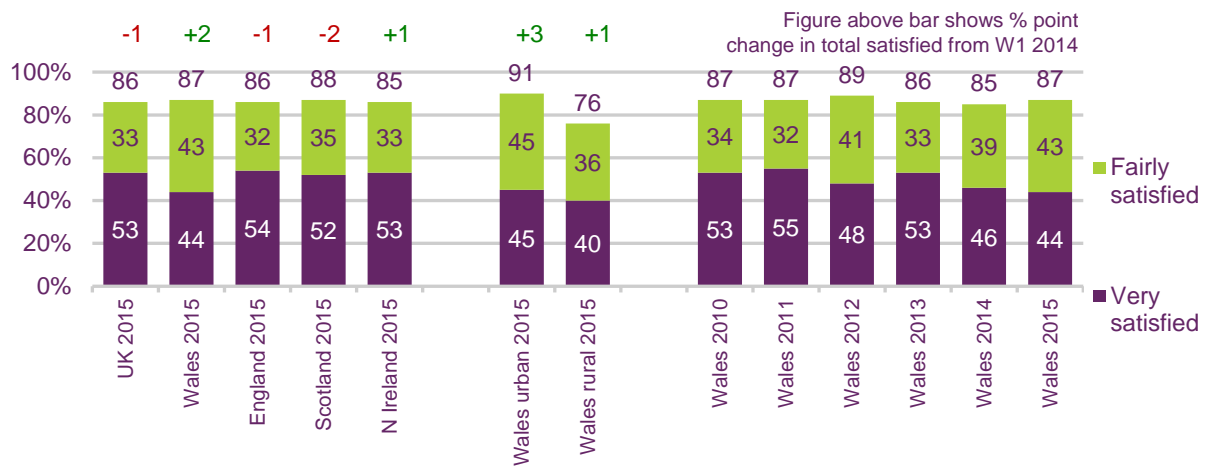
Note: Figures above chart columns indicate the proportion of people who were 'very' or 'fairly' satisfied with their speed of service while online

QE8b. Thinking about your fixed broadband internet service, how satisfied are you with (main supplier) for the overall service/ for the speed of your service while online (not just the connection)?

Mobile users in Wales are less likely than the UK overall to say they are very satisfied with their mobile phone reception

Almost nine in ten mobile phone users in Wales (87%) were 'very' or 'fairly' satisfied with their mobile provider reception in Q1 2015 (Figure 4.17). While overall satisfaction in Wales was in line with the UK average (86%), users in Wales were less likely to say that they were 'very' satisfied with their mobile reception (44% vs. 53% for the UK overall). There was no change in levels of satisfaction with mobile phone reception among users in Wales in the year to Q1 2015, and users in urban areas were more likely to say they were satisfied with their mobile reception, compared to those in rural areas (91% vs. 76%).

Figure 4.17 Satisfaction with reception of mobile service



Source: Ofcom Technology Tracker, wave 1 2015

Base: Adults aged 16+ who personally use a mobile phone (n = 3425 UK, 439 Wales, 2080 England, 450 Scotland, 456 Northern Ireland, 221 Wales urban, 218 Wales rural, 923 Wales 2010, 416 Wales 2011, 456 Wales 2012, 440 Wales 2013, 438 Wales 2014, 439 Wales 2015)

Note: Figures above chart columns indicate the proportion of people who were 'very' or 'fairly' satisfied with their mobile reception

QD21c. Thinking about your mobile phone service only, how satisfied are you with (main supplier) for reception/ accessing network?