Office for National Statistics

Article

# Coronavirus and the impact on output in the UK economy: April 2020

Analysis of monthly growth for the production, services and construction industries in the UK economy between March 2020 and April 2020, highlighting the early impact from the coronavirus (COVID-19) pandemic.

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# 1 . Main points

- The economy has experienced a significant shock since the start of the coronavirus (COVID-19) pandemic; GDP has fallen dramatically, with record broad-based falls in output for production, services and construction.
- Analysis of our Monthly Business Survey (MBS) returns and external data, including comments from over 15,000 businesses, has shown that the coronavirus (COVID-19) had a significant and wide-ranging negative impact on output during April 2020.
- April 2020 has experienced sharper falls than March as the negative impacts of social distancing and "lockdown" have led to a significant fall in consumer demand and business and factory closures, as well as supply chain disruptions.

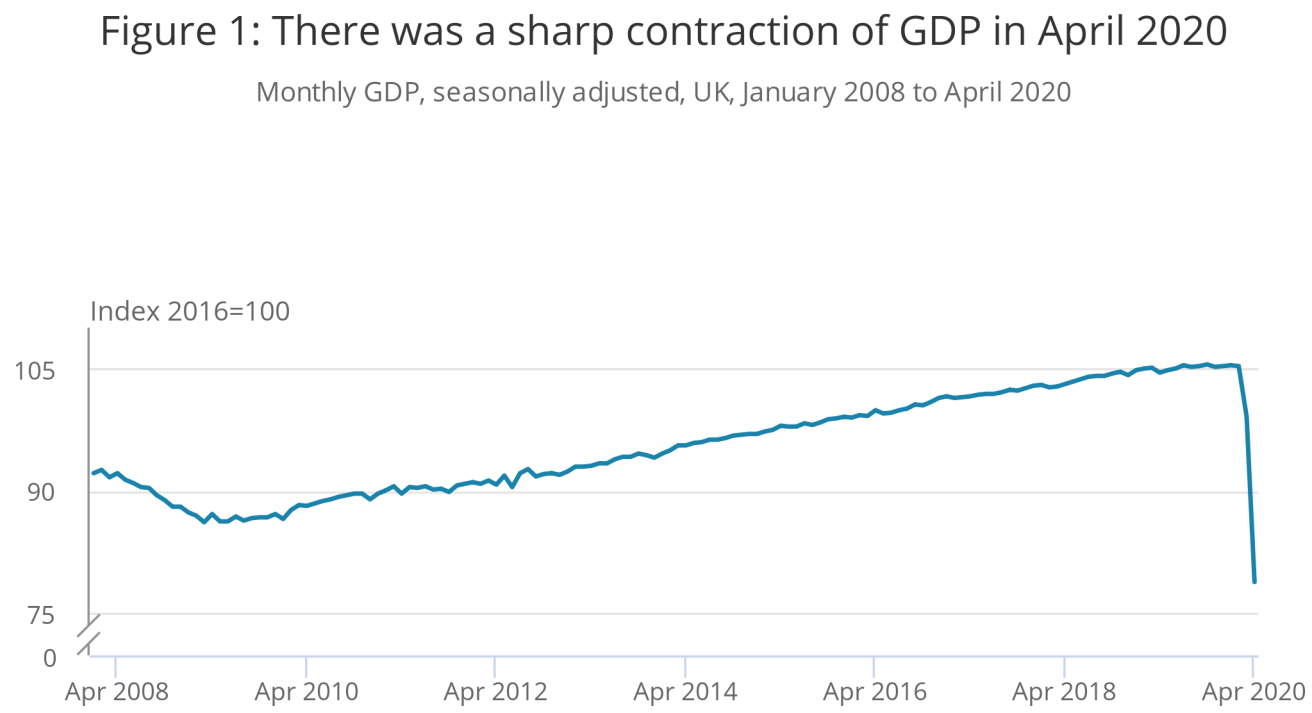
# 2 . The UK economy during the coronavirus (COVID-19) pandemic

GDP fell by 20.4% in the month, the largest fall since monthly records began in 1997, reflecting record widespread falls in services, production and construction output[1]. For more details please see GDP monthly estimate, UK: April 2020.

We would advise users to be mindful of breaks in the side axis when interpreting charts within this article.

**Figure 1: There was a sharp contraction of GDP in April 2020**

**Monthly GDP, seasonally adjusted, UK, January 2008 to April 2020**




**Source: Office for National Statistics – Monthly GDP**

**Notes:**

1. We would advise users to be mindful of a break in the side axis when interpreting this chart.

The monthly decline in GDP in April 2020 is three times greater than the fall experienced during the 2008 to 2009 economic downturn. During the global financial crisis, from the peak in February 2008 to the lowest point of March 2009, a total of 13 months, GDP contracted 6.9%.

Between March 2020 and April 2020, GDP has fallen by 20.4%, equivalent to a fall of approximately £30 billion in Gross Value Added.

Table 1: The five largest falls in Monthly GDP since records began
Monthly GDP, seasonally adjusted, UK, January 1997 to April 2020

| Date | mGDP | Significant factors during this period |
|---|---|---|
| **April 2020** | -20.4% | COVID-19 |
| **March 2020** | -5.8% | COVID-19 |
| **June 2002** | -2.2% | Queen's Golden Jubilee (extra bank holiday) |
| **June 2012** | -1.5% | Queen's Diamond Jubilee (extra bank holiday) |
| **September 2008** | -1.0% | During the 2008 to 2009 economic downturn |

Source: Office for National Statistics

Analysis of our Monthly Business Survey (MBS) returns and external data, including comments from over 15,000 businesses, confirmed that the coronavirus (COVID-19) pandemic had a significant and broad-based negative impact on output during April 2020, though some industries were less affected than others. This was caused by a complex mix of factors, including the effects of social distancing, which led to a fall in consumer demand, business and factory closures and supply chain disruptions.

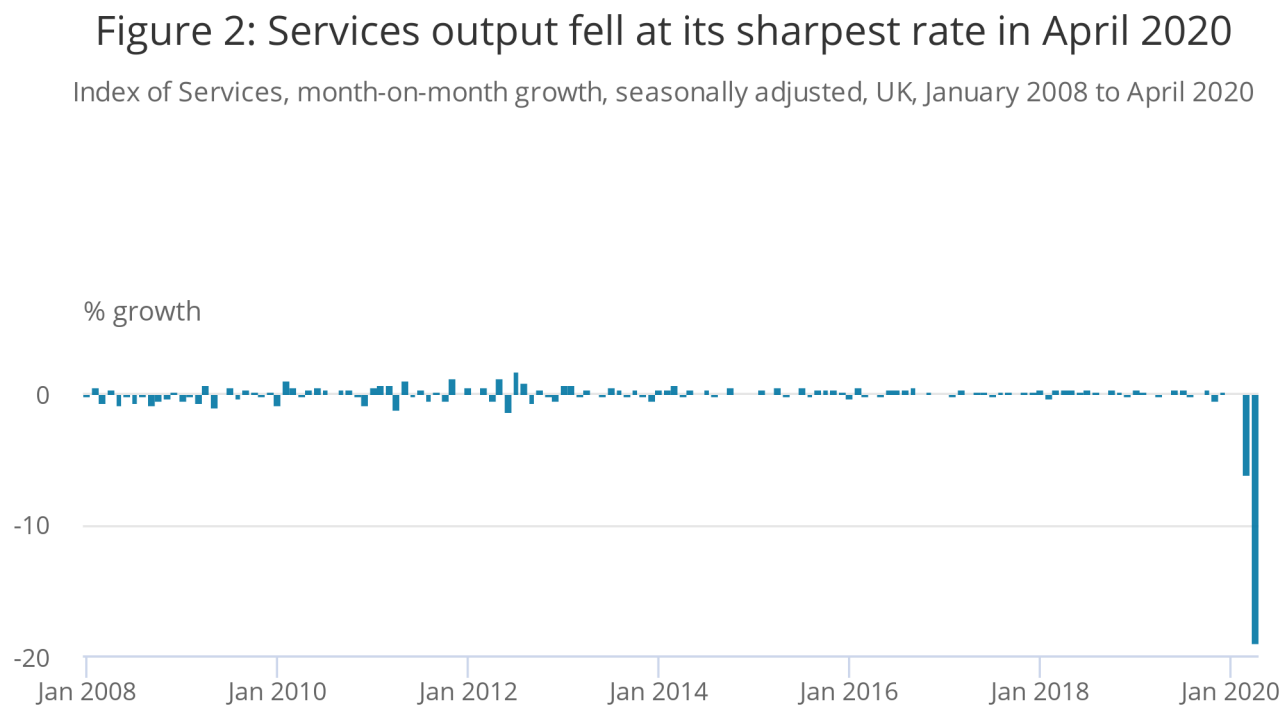
The output of services industries fell by 19.0% in April 2020, the largest monthly fall since records began in January 1997.

**More about coronavirus**

- Find the latest on coronavirus (COVID-19) in the UK.
- All ONS analysis, summarised in our coronavirus roundup.
- View all coronavirus data.
- Find out how we are working safely in our studies and surveys.

**Figure 2: Services output fell at its sharpest rate in April 2020**

**Index of Services, month-on-month growth, seasonally adjusted, UK, January 2008 to April 2020**




**Source: Office for National Statistics – Index of Services**

Table 2: The five largest falls in services output since records began
Index of Services, seasonally adjusted, UK, January 1997 to April 2020

| Date | mGDP | Significant factors during this period |
|---|---|---|
| **April 2020** | -19.0% | COVID-19 |
| **March 2020** | -6.2% | COVID-19 |
| **June 2002** | -2.1% | Queen's Golden Jubilee (extra Bank Holiday) |
| **June 2012** | -1.3% | Queen's Diamond Jubilee (extra Bank Holiday) |
| **April 2012** | -1.1% | Prince William and Catherine Middleton married (extra Bank Holiday) |

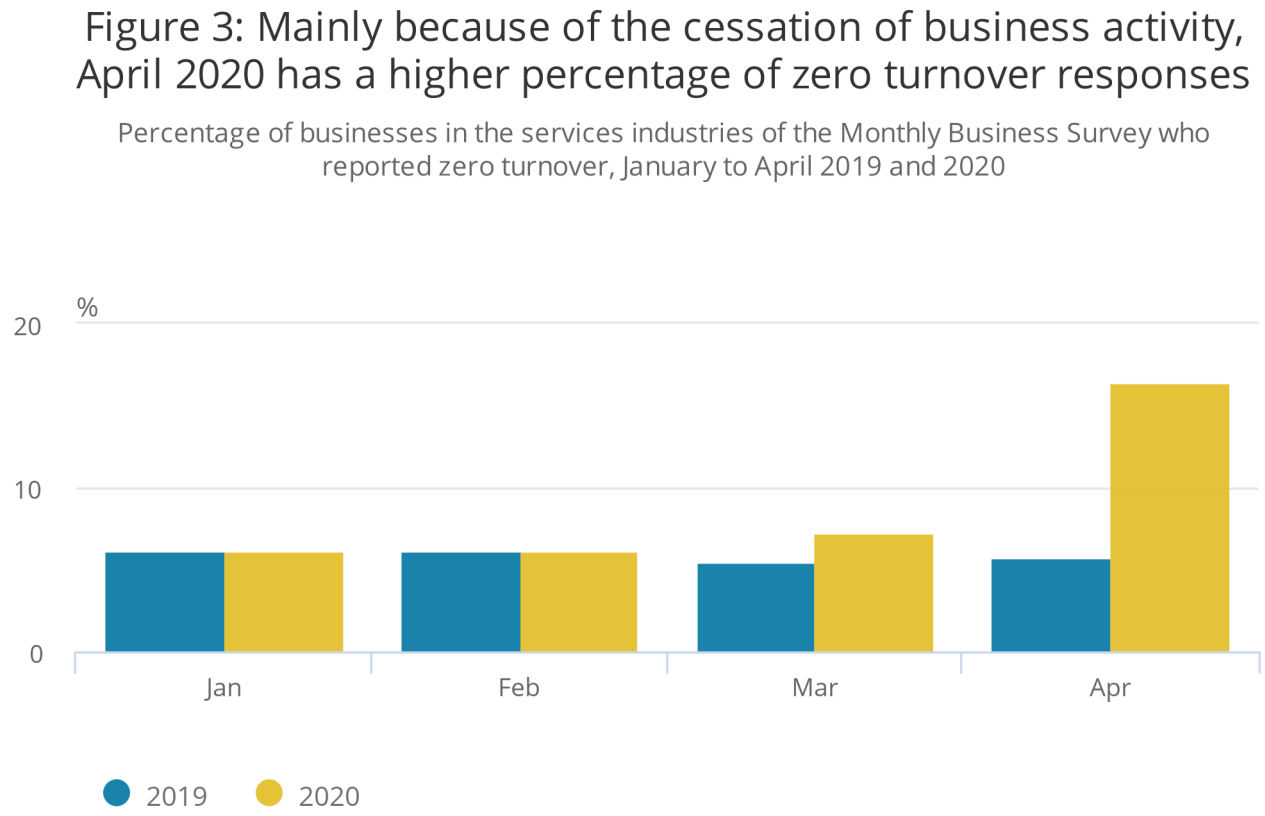
Source: Office for National Statistics - Index of Services

Those industries that had very large falls in April 2020 were due to cessation of business activities and this can be seen in the number of businesses who reported zero turnover in April 2020 (Figure 3). In Wave 2 of the Business Impact of COVID-19 (BICS) survey (23 March to 5 April 2020) there were five industries where 75% or more of the businesses said they had temporarily closed or paused trading:

- sports activities and amusement and recreation activities
- accommodation
- food and beverage service activities
- libraries, archives, museums and other cultural activities
- creative, arts and entertainment activities

**Figure 3: Mainly because of the cessation of business activity, April 2020 has a higher percentage of zero turnover responses**

**Percentage of businesses in the services industries of the Monthly Business Survey who reported zero turnover, January to April 2019 and 2020**

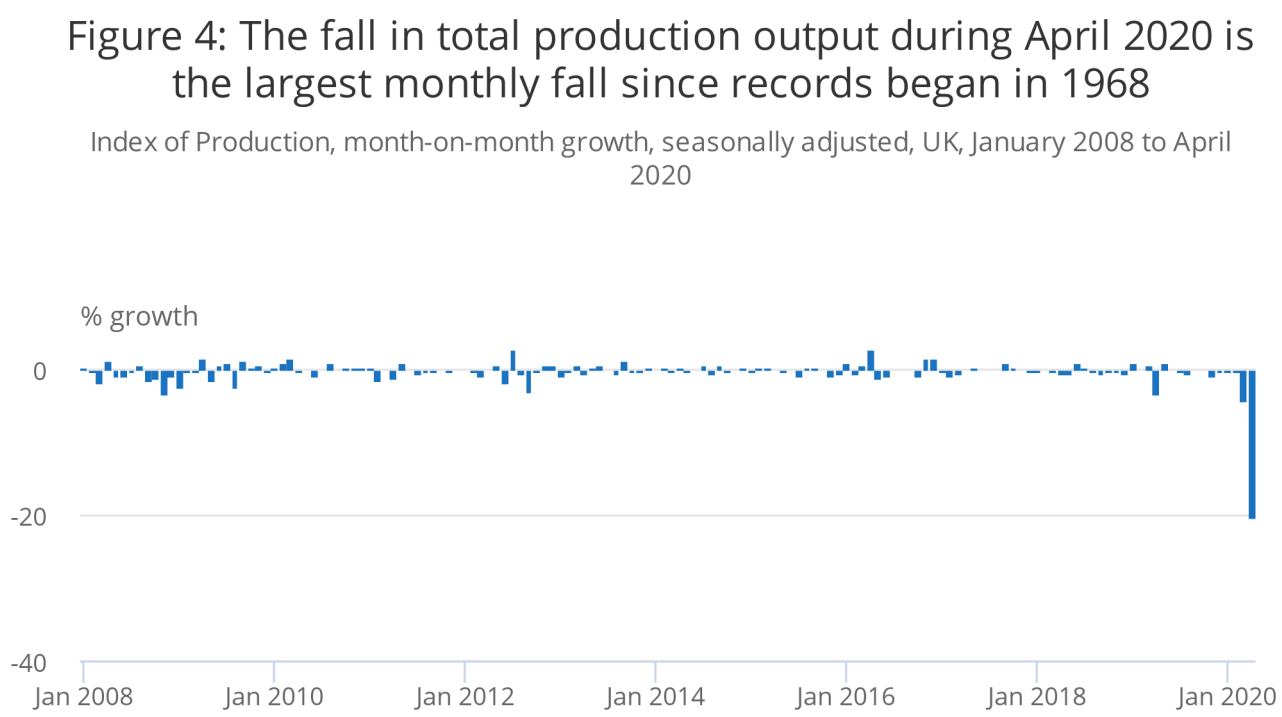



**Source: Office for National Statistics – Monthly Business Survey (MBS)**

The production industries had a strong decline in output of 20.3% during April 2020 (Figure 4). This was the largest monthly fall since records for production output began in January 1968.

**Figure 4: The fall in total production output during April 2020 is the largest monthly fall since records began in 1968**

**Index of Production, month-on-month growth, seasonally adjusted, UK, January 2008 to April 2020**




**Source: Office for National Statistics – Index of Production**

Table 3: The five largest falls in production output since records began
Index of Production, seasonally adjusted, UK, January 1968 to April 2020

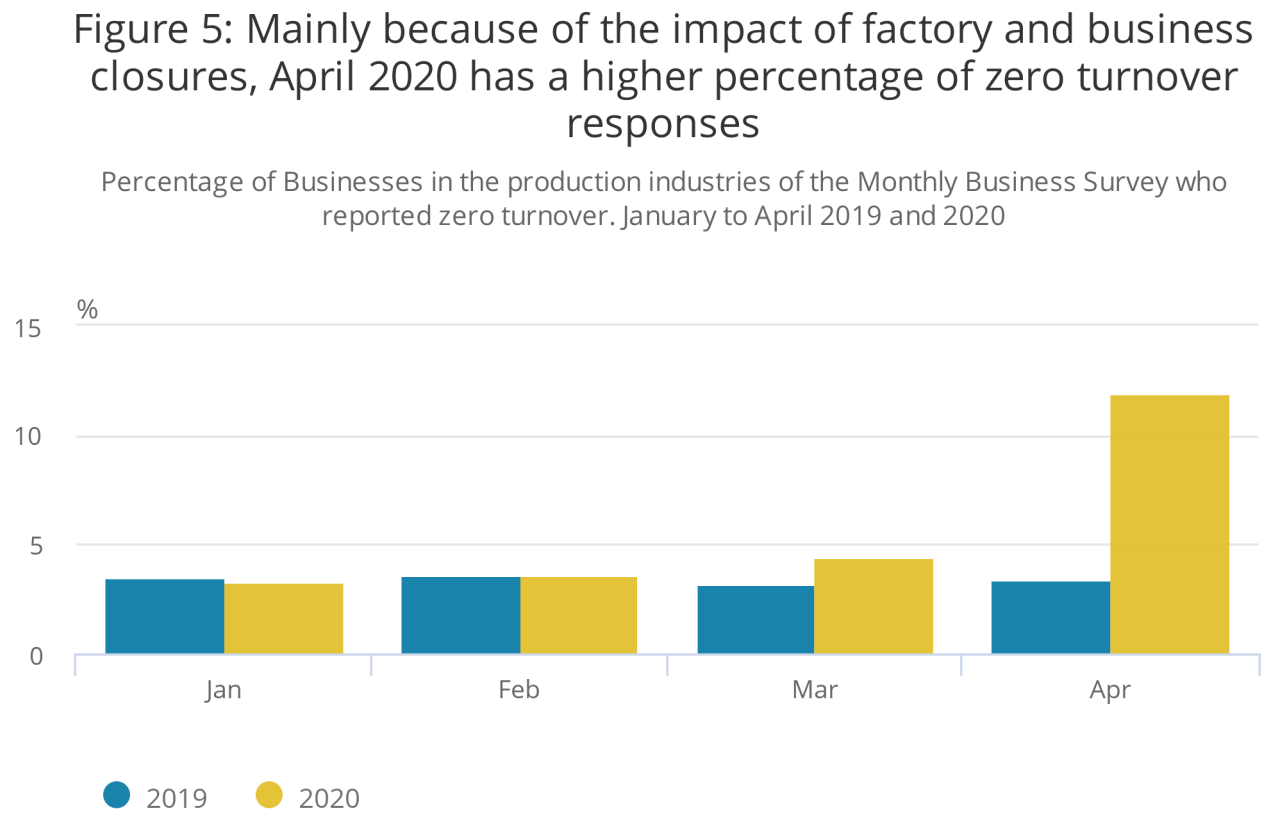
| Date | Growth | Significant factors during this period |
|---|---|---|
| **April 2020** | -20.3% | COVID-19 |
| **February 1972** | -8.0% | Miner's Strikes |
| **January 1974** | -7.3% | Miner's Strikes |
| **January 1974** | -7.0% | "Winter of Discontent" |
| **March 2020** | -4.2% | COVID-19 |

Source: Office for National Statistics - Index of Production

To further highlight the impact a full month of lockdown restrictions had across the production sector during April 2020, Figure 5 displays the percentage of zero turnover responses from our Monthly Business Survey (MBS) in production industries in comparison with recent months during 2019 and 2020.

**Figure 5: Mainly because of the impact of factory and business closures, April 2020 has a higher percentage of zero turnover responses**

**Percentage of Businesses in the production industries of the Monthly Business Survey who reported zero turnover. January to April 2019 and 2020**

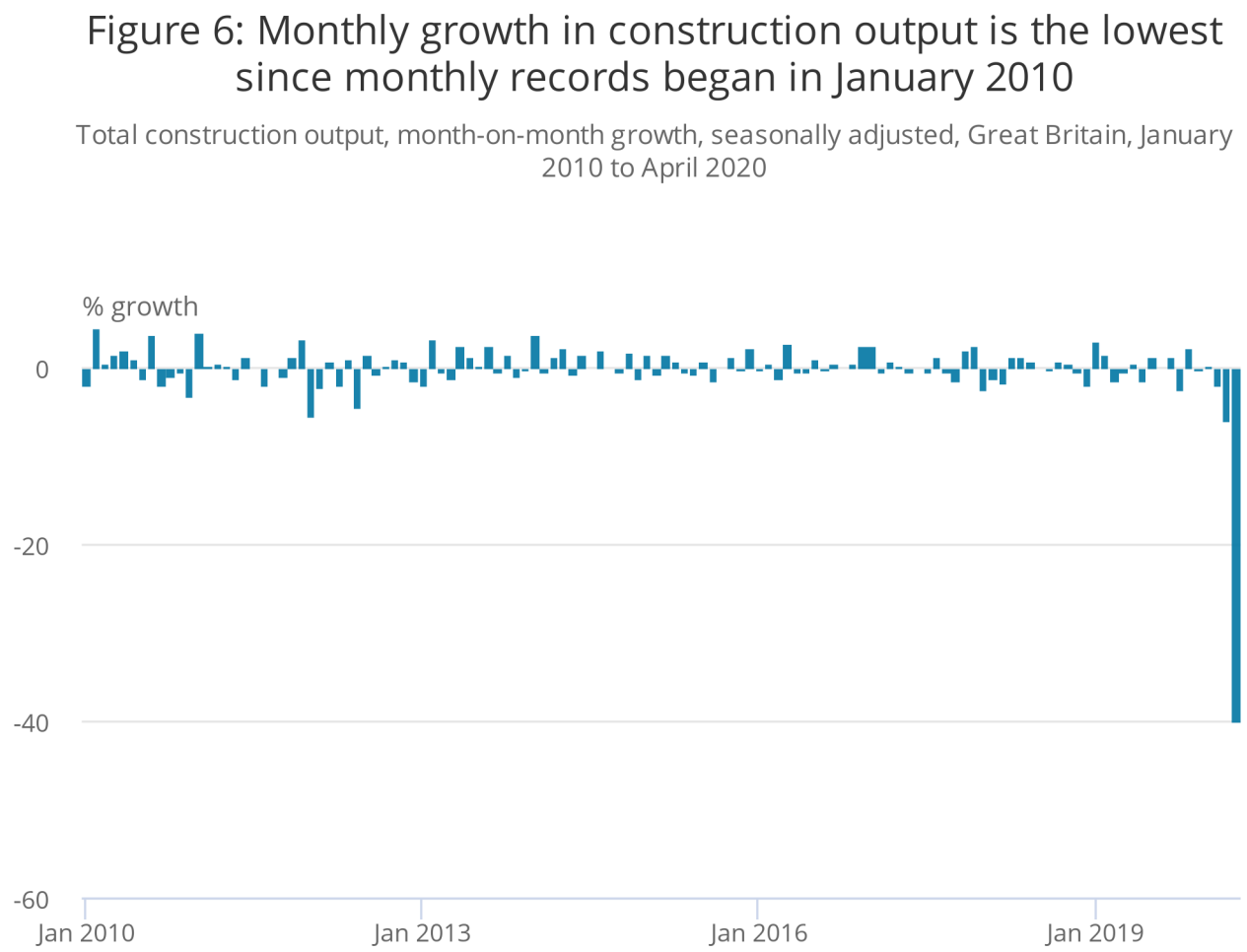



**Source: Office for National Statistics – Monthly Business Survey**

The construction industry experienced a strong decline in output of 40.1% during April 2020 (Figure 6). This is the largest fall since monthly records began in January 2010. The coronavirus (COVID-19) pandemic had a significant and broad-based negative impact on construction output during April 2020.

**Figure 6: Monthly growth in construction output is the lowest since monthly records began in January 2010**

**Total construction output, month-on-month growth, seasonally adjusted, Great Britain, January 2010 to April 2020**




**Source: Office for National Statistics – Index of Construction**

Further detail on the performance in the construction industry is given in Construction output in Great Britain: April 2020.

Table 4: The five largest falls in construction output since records began
Construction output, seasonally adjusted, Great Britain, January 2010 to April 2020

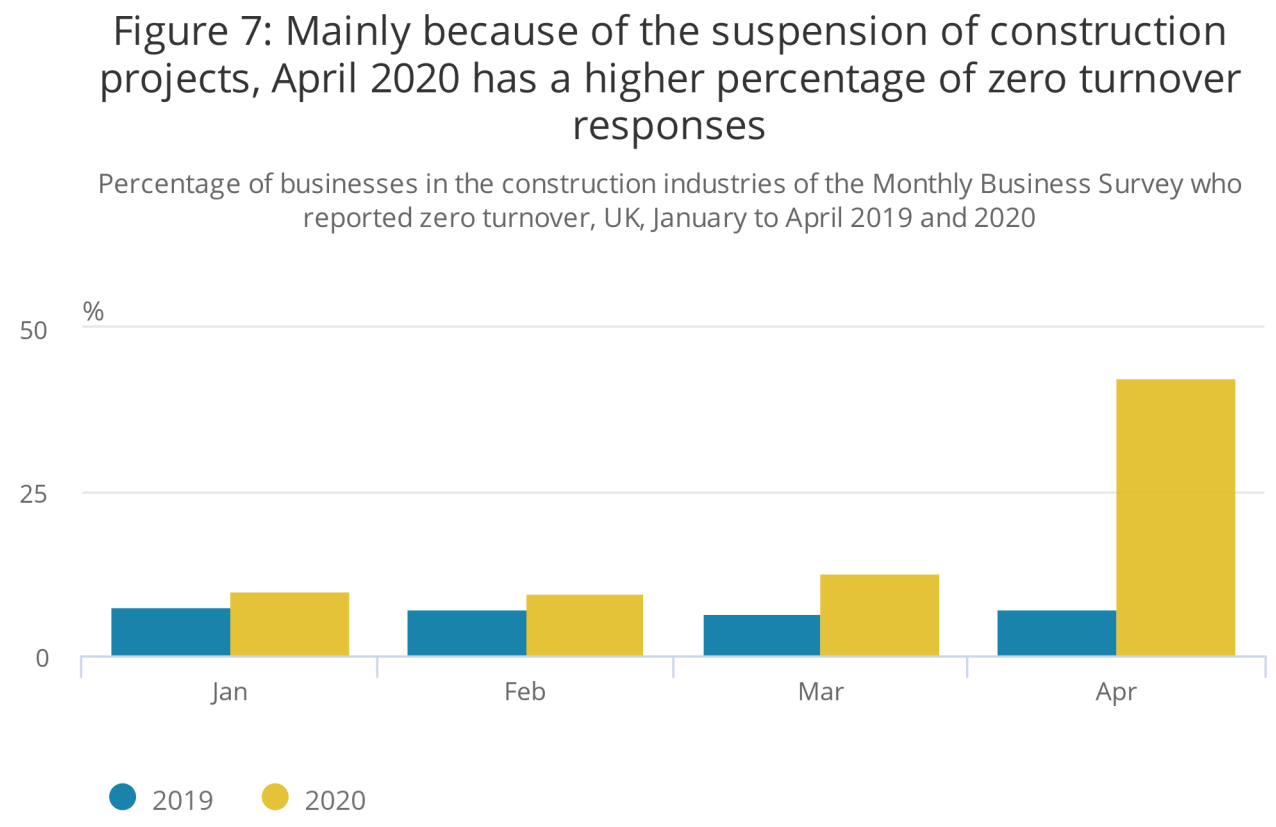
| Date | Growth | Significant factors during this period |
|---|---|---|
| **April 2020** | -40.1% | COVID-19 |
| **March 2020** | -5.9% | COVID-19 |
| **January 2012** | -5.4% | Weather related (storms) and strong Dec 2011 growth |
| **June 2012** | -4.4% | Queen's Diamond Jubilee (extra Bank Holiday) |
| **December 2010** | -3.3% | Weather related (snow) |

Source: Office for National Statistics - Construction Output

To further highlight the impact the lockdown restrictions had across construction during April 2020, Figure 7 displays the percentage of zero turnover responses, from our Monthly Business Survey (MBS), for those businesses classified within the construction sector, in comparison with recent months during 2019 and 2020.

**Figure 7: Mainly because of the suspension of construction projects, April 2020 has a higher percentage of zero turnover responses**

**Percentage of businesses in the construction industries of the Monthly Business Survey who reported zero turnover, UK, January to April 2019 and 2020**




**Source: Office for National Statistics – Monthly Business Survey**

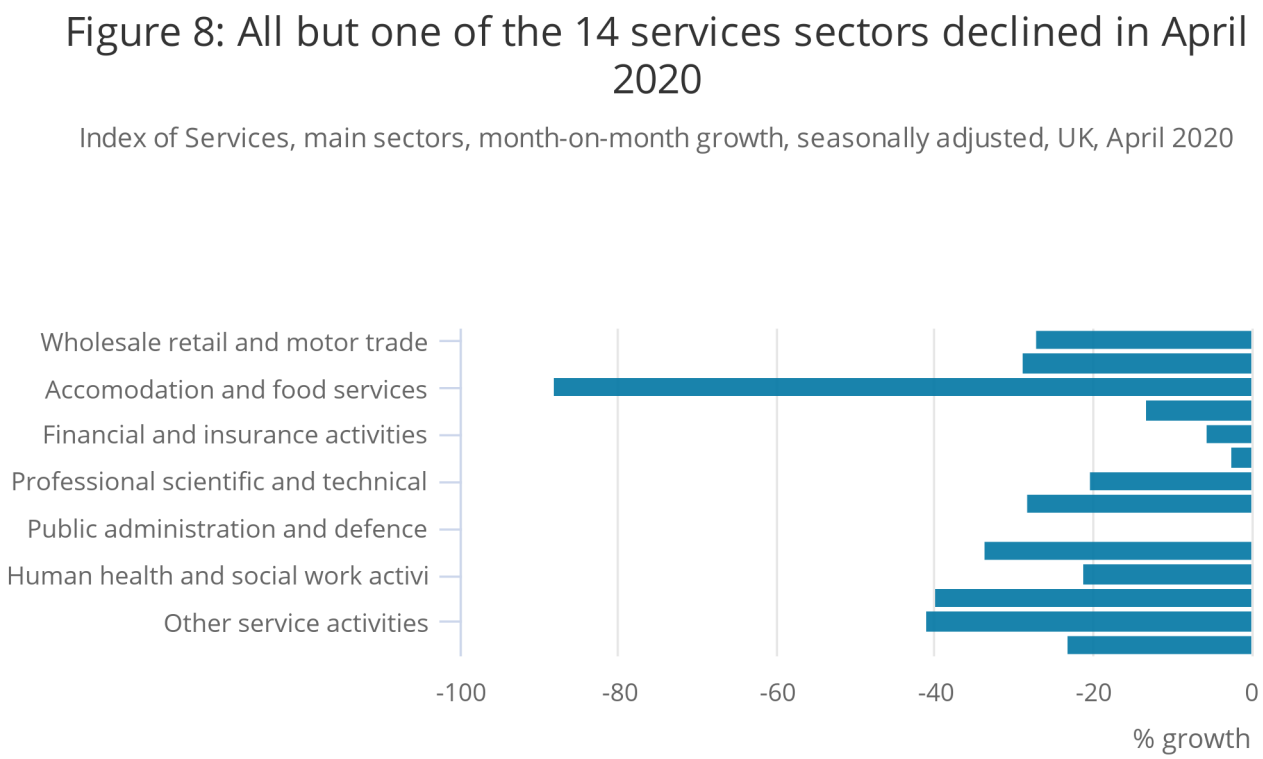
## Notes for: The UK economy during the coronavirus (COVID-19) pandemic

1. Services comprise 79.6% of the UK economy, while production and construction comprise 13.6% and 6.1% respectively.

# 3 . Services industries

**Figure 8: All but one of the 14 services sectors declined in April 2020**

**Index of Services, main sectors, month-on-month growth, seasonally adjusted, UK, April 2020**




**Source: Office for National Statistics – Index of Services**

Of the 14 services sectors, 11 experienced their largest falls since records began in January 1997. Table 5 contains all sectors of the Index of Services and the current growth, along with the last time that growth was lower, or at the same growth, to two decimal places.

Table 5: 11 of the 14 services sectors have had the largest falls since records began in January 1997
Index of Services, all sectors, current growth and last time growth was weaker, UK, April 2020

| | | Current Growth | Last time growth was weaker (or the same) |
|---|---|---|---|
| **Services industries** | **IoS** | -19.0% | Last time growth was weaker (or the same) |
| **Wholesale and retail trade; repair of motor vehicles and motorcycles** | **G** | -27.0% | Weakest on record[1] |
| **Transportation and storage** | **H** | -28.8% | Weakest on record |
| **Accommodation and food service activities** | **I** | -88.1% | Weakest on record |
| **Information and communication** | **J** | -13.0% | Weakest on record |
| **Financial and insurance activities** | **K** | -5.3% | Weakest on record |
| **Real estate activities** | **L** | -2.4% | Weaker in April 2011 at -5.4% |
| **Professional, scientific and technical activities** | **M** | -20.1% | Weakest on record |
| **Administrative and support services activities** | **N** | -28.1% | Weakest on record |
| **Public administration and defence; compulsory social security** | **O** | 0.0% | Weakest on record |
| **Education** | **P** | -33.6% | Equal in February 2020 at 0.0% |
| **Human health and social work activities** | **Q** | -20.9% | Weakest on record |
| **Arts, entertainment and recreation** | **R** | -39.7% | Weakest on record |
| **Other service activities** | **S** | -40.9% | Weakest on record |
| **Activities of households as employers** | **T** | -22.9% | Weaker in August 2005 at -23.9% |

Source: Office for National Statistics - Index of Services

Notes

1. There has never been a growth equal to or weaker than in April 2020. Back to table

The services industries were most effected by industries impacted by social distancing, for example, travel and tour operators, accommodation and food and beverage services.

Of the 50 services industries, 40 fell by 10% or more, 27 by more than 20% and 8 more than 50%.

Table 6: The ten largest industry falls in the services industries
Index of Services, monthly growth, seasonally adjusted, UK, April 2020

| Industry | Growth |
|---|---|
| **Air Transport** | -92.8% |
| **Travel Agency, Tour Operator And Other Reservation Service And Related Activities** | -89.2% |
| **Food And Beverage Service Activities** | -88.5% |
| **Wholesale And Retail Trade And Repair Of Motor Vehicles And Motorcycles** | -87.3% |
| **Accommodation** | -86.9% |
| **Rail transport** | -70.4% |
| **Other Personal Service Activities** | -60.0% |
| **Creative, Arts And Entertainment Activities** | -50.8% |
| **Sports Activities And Amusement And Recreation Activities** | -45.2% |
| **Motion Picture, Video & TV Programme Production, Sound Recording & Music Publishing Activities** | -42.1% |

Source: Office for National Statistics - Index of Services

## Wholesale and retail trade

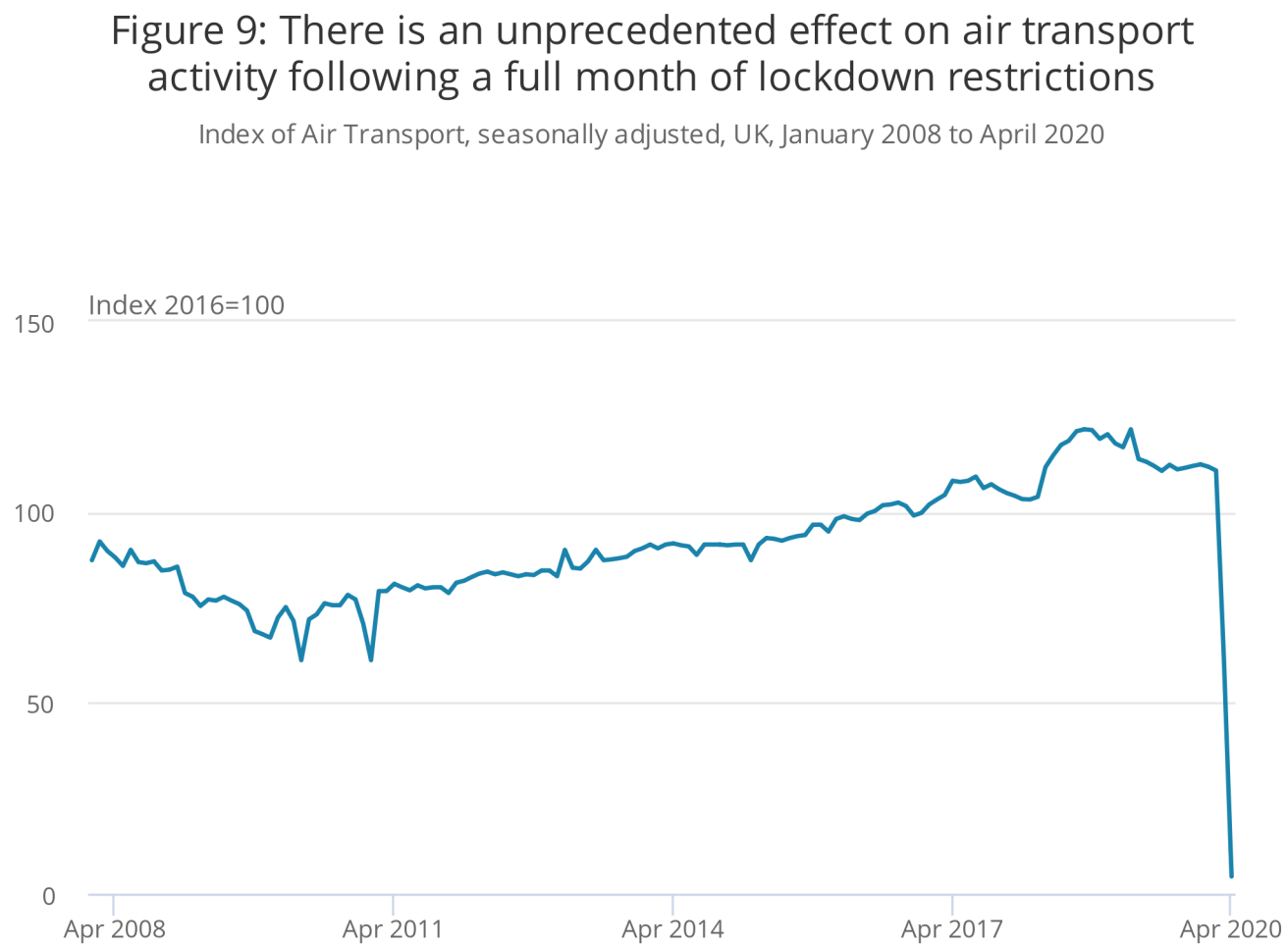
Wholesale and retail trade; repair of motor vehicles and motorcycles saw little strength in April 2020. Any strength in this industry came from the supply of parts and maintenance of emergency vehicles as retailers were largely shutdown for this period.

## Transportation and storage

In the transport sector, passenger numbers were affected more greatly than freight. For example, air transport has more passengers than freight and saw a bigger fall than water transport where the majority of the industry is transport of freight.

**Figure 9: There is an unprecedented effect on air transport activity following a full month of lockdown restrictions**

**Index of Air Transport, seasonally adjusted, UK, January 2008 to April 2020**




**Source: Office for National Statistics – Index of Services**

The fall in warehousing, which is usually well aligned to wholesale and retail trade, was tempered by an increase in online shopping.

Postal and courier services have been affected by business usage as staff have been working from home, however businesses in this industry dealing with personal deliveries and working with online orders have seen a boost.

## Accommodation and food service activities

In accommodation there was some activity involving supplying rooms to those who are vulnerable and to key workers, however this did not stop this industry falling substantially.

Food and beverage services was one of the largest falling services industries due to restaurants and pubs being closed for the duration of April 2020. There was some anecdotal evidence of businesses adapting to social distancing measures by supplying take-away food but the main business operation ceasing had a large negative impact in this industry.

## Information and communication

In the information and communication sector, the motion picture and TV industry was badly hit. Production and cinema screenings were much more badly effected than distribution.

Computer programming, consultancy and related activities has been supported by the number of people homeworking with larger businesses faring better than smaller businesses. Similarly, telecommunication and programming and broadcasting activities have also been resilient to falls in output.

## Real estate activities

Despite house sales being extremely low, real estate agents still received turnover from property rentals, minimising the fall of 38.1% from this industry. The largest component of real estate activities, imputed rent, accounts for approximately 70% of the industry and is based on forecasted data for the second quarter. This industry remained flat in April 2020. Domestic rentals and commercial property account for 27% of the industry and fell by 4.8%.

## Professional, scientific and technical activities

In the professional scientific and technical activities sector, veterinary activities fell the most. The fall in architects follows a comparatively strong position in March 2020. Other industries in this sector were less impacted by the outbreak of coronavirus (COVID-19) as staff in these areas are able to work from home, with larger businesses suffering the effects far less than smaller businesses.

## Education

Approximately 69% of the education sector is government output, which is measured using direct volume indicators, rather than by deflating expenditure. The volume of educational activities is approximated as detailed in Section 4 of Coronavirus and the effects on UK GDP. This element of education saw an approximate 35% fall in April 2020. We have modelled a similar fall for private education, accounting for 9% of education output. The Monthly Business Survey measures 23% of the education industry including universities; this element of education fell by approximately 27%.

## Human health and social work activities

Approximately 85% of human health and social work is government output, which is measured using direct volume indicators, rather than by deflating expenditure. The volume of government healthcare output in the UK is estimated, using available information on the number of different kinds of activities and procedures and weighted by the cost of each activity. It is detailed in Section 4 of Coronavirus and the effects on UK GDP. This element of health saw an approximate 29% fall in April 2020 based upon provisional and modelled data. The Monthly Business Survey measures 15% of the health industry and includes non-government health care; this element of health care fell by approximately 11%.

### Arts, entertainment and recreation

Creative, arts and entertainment activities includes both venues and artists. Venues were significantly impacted due to being required to close during April 2020 along with the cancellation of activities. Artists still received royalties in this period. Libraries, archives, museums and other cultural activities saw evidence of grants being brought forward from later in the year to support businesses usually reliant on attendance.

### Other service activities

Other personal services saw a large impact, mostly from the closure of hairdressers and beauty salons, however there was some anecdotal evidence of online sales from beauty salons taking place in April 2020. Funeral directors showed a small rise in the number of funerals being carried out.

## 4 . Production sectors

Despite widespread weakness across all four sectors during April 2020, the decline of 20.3% was primarily because of the fall of 24.3% from the manufacturing sector, which accounts for 75% of the production industries.

There was a significant negative effect on the production industries because of the Coronavirus (COVID-19) pandemic. The lockdown restrictions and social distancing measures introduced on 23 March 2020 were in place during the entire month of April, which impacted on:

- normal trading and factory operating conditions
- supply chains (in the UK and overseas)
- consumer demand

In turn, this has resulted in record falls for many manufacturing subsectors during April.

Table 7 contains monthly growth for the main production sectors and manufacturing sub-sectors, along with the last time that growth was lower, or at the same growth to two decimal places.

Table 7: 11 of the 13 manufacturing sub-sectors recorded the largest falls since records began in 1968
Index of Production, monthly growth and last time growth was weaker, UK, April 2020

| | | Current Growth | Last time growth was weaker (or the same) |
|---|---|---|---|
| **Index of Production** | **IoP** | -20.4% | Weakest on record[1] |
| **Mining and quarrying** | **B** | -12.2% | Weaker in Dec 2017 at -19.3% |
| **Electricity and Gas** | **D** | -9.5% | Weaker in Jan 2003 at -11.8% |
| **Water supply and sewerage** | **E** | -5.3% | Weaker in Sept 2012 at -5.4% |
| **Total manufacturing** | **C** | -24.3% | Weakest on record |
| **Food products, beverages and tobacco** | **CA** | -10.9% | Weakest on record |
| **Textiles, wearing apparel and leather products** | **CB** | -49.6% | Weakest on record |
| **Wood and paper products and printing** | **CC** | -27.7% | Weakest on record |
| **Coke and refined petroleum products** | **CD** | -24.7% | Weakest on record |
| **Chemicals and chemical products** | **CE** | -9.5% | Weaker in Jan 1979 at -19.1% |
| **Basic pharmaceutical products and pharmaceutical preparations** | **CF** | 4.7% | Weaker in Feb 2020 at 4.2% |
| **Rubber and plastics products, and other non-metallic mineral products** | **CG** | -40.0% | Weakest on record |
| **Basic metals and metal products** | **CH** | -27.4% | Weakest on record |
| **Computer, electronic and optical products** | **CI** | -17.5% | Weakest on record |
| **Electrical equipment** | **CJ** | -25.8% | Weakest on record |
| **Machinery and equipment n.e.c** | **CK** | -36.2% | Weakest on record |
| **Transport equipment** | **CL** | -50.2% | Weakest on record |
| **Other manufacturing and repair** | **CM** | -31.5% | Weakest on record |

Source: Office for National Statistics - Index of Production

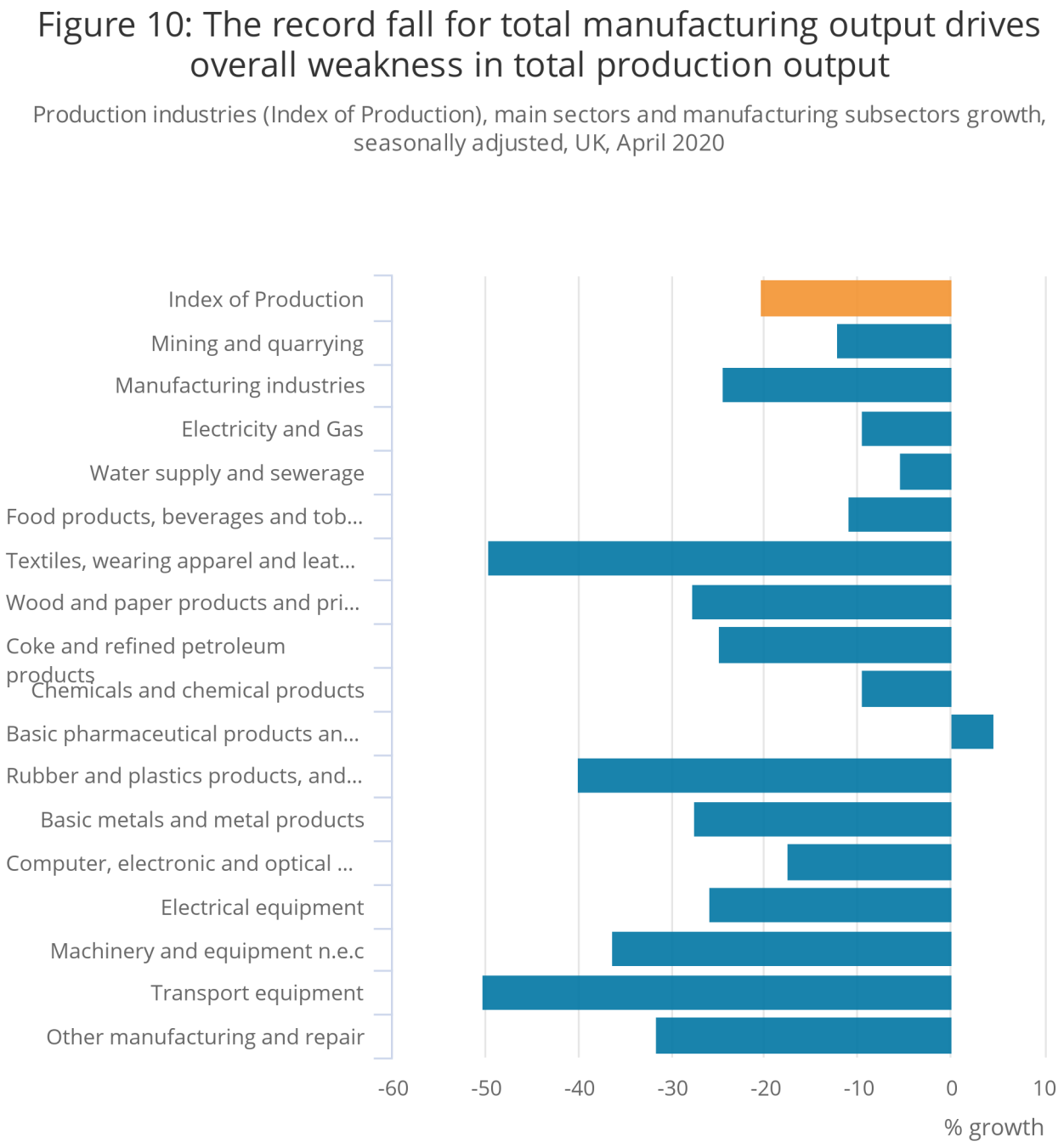
Notes

1. There has never been a growth equal to or weaker than in April 2020. Back to table

Figure 10 shows monthly growth for the four main production sectors and manufacturing sub-sectors. The significant decline within manufacturing was the largest monthly fall since records began in January 1968, led by widespread weakness, with 12 of the 13 sub-sectors displaying negative growth. There was also notable weakness at industry level, where the five largest fallers all displayed a record decline in output (Table 8).

**Figure 10: The record fall for total manufacturing output drives overall weakness in total production output**

**Production industries (Index of Production), main sectors and manufacturing subsectors growth, seasonally adjusted, UK, April 2020**




**Source: Office for National Statistics – Index of Production**

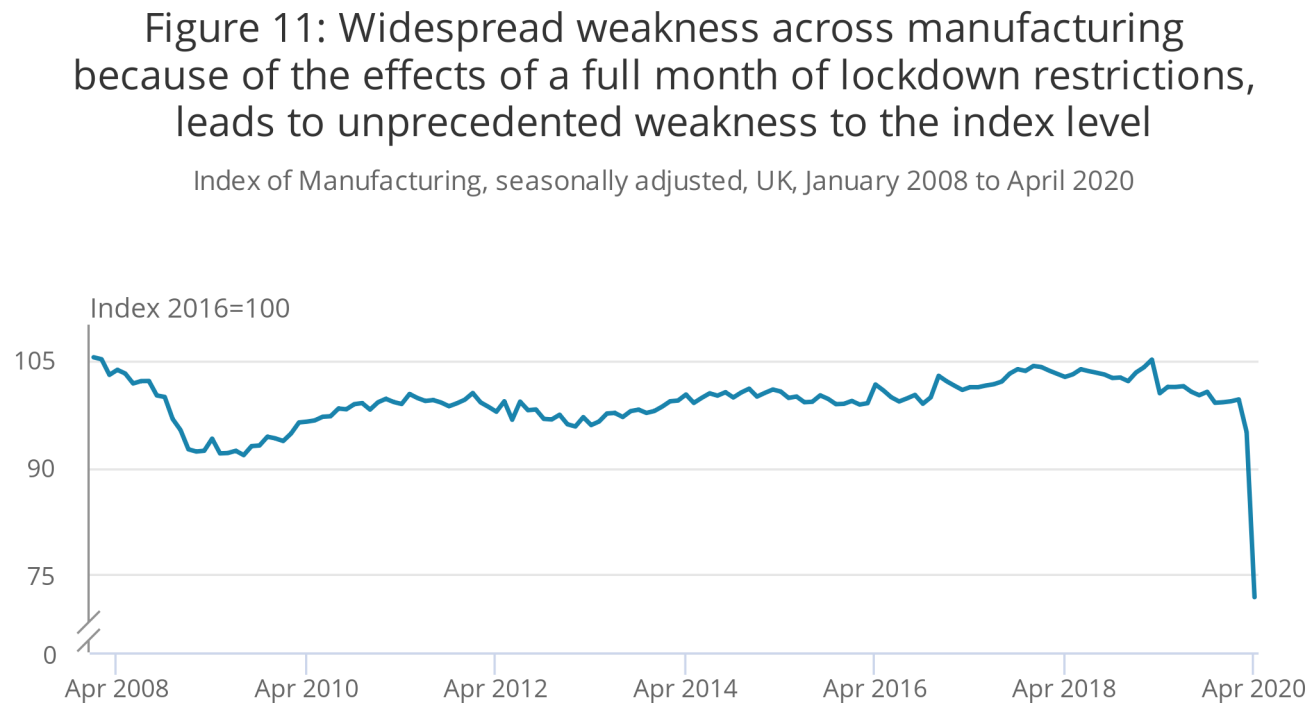
Table 8: Top five monthly percentage falls at industry level
Index of Manufacturing, UK, seasonally adjusted, April 2020

| Industry | Growth |
|---|---|
| **Motor vehicles, trailers and semi trailers** | -90.3 |
| **Furniture** | -69.7 |
| **Leather and related products** | -59.2 |
| **Wearing apparel** | -52.3 |
| **Wood and wood prods except furniture** | -51 |

Source: Office for National Statistics - Index of Production

**Figure 11: Widespread weakness across manufacturing because of the effects of a full month of lockdown restrictions, leads to unprecedented weakness to the index level**

**Index of Manufacturing, seasonally adjusted, UK, January 2008 to April 2020**




**Source: Office for National Statistics – Index of Production**

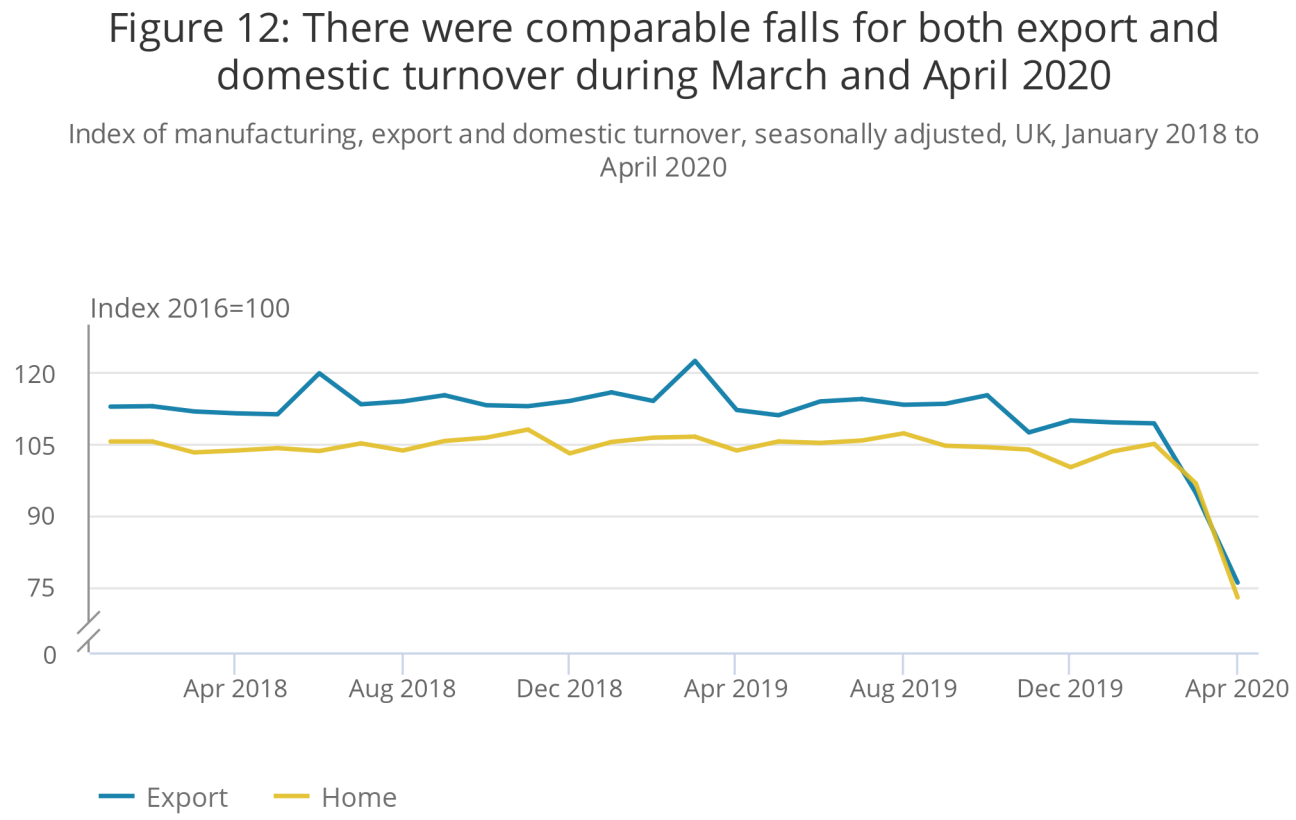
**Notes:**

1. We would advise users to be mindful of a break in the side axis when interpreting this chart.

Both seasonally adjusted export and domestic turnover growth over both March and April 2020 fell comparably. However, there was a slightly sharper fall in exports during March, suggesting that the UK's export market started to weaken earlier than the domestic market during March, possibly reflecting the timing of countries going into lockdown, which in turn impacted on supply chains. In contrast, domestic turnover fell more sharply during April because of the effects of a full month of lockdown restrictions (Figure 12).

**Figure 12: There were comparable falls for both export and domestic turnover during March and April 2020**

**Index of manufacturing, export and domestic turnover, seasonally adjusted, UK, January 2018 to April 2020**




**Source: Office for National Statistics – Index of Production**

**Notes:**

1. We would advise users to be mindful of a break in the side axis when interpreting this chart.

Given the widespread impact of the coronavirus (COVID-19) pandemic across production and manufacturing, we have highlighted the most interesting anecdotal evidence, impacting both positively and negatively, on subsector and industry level growth.

## Motor vehicles, trailers and semi-trailers (Division 29)

This industry had a record monthly fall of 90.3%. We received responder led evidence that all major manufacturers shutdown, with only a small amount of sales from inventories. Some other manufacturers did remain open, primarily to service key worker demand but 21.1% of responders returned zero turnover, compared with 1.6% in March 2020.

Although a similar fall compared with April 2019 is reported by the Society for Motor Manufacturing Traders (SMMT), ONS estimates also include products produced by major manufacturing businesses, so will include some research and development and corporate activity.

We have also received evidence of some diversification in activity, with medical products being manufactured for the first time by some businesses.

## Alcoholic beverages (Division 11.01-06)

The record fall of 24.8% is driven by factory closures with 23% of breweries and 17% distilleries reporting zero turnover. Larger brewers fared better overall. There was a clear impact from a fall in demand from the hospitality industry. As a result, some businesses diversified, for example, using alcohol to produce hand sanitiser products or selling direct to domestic users.

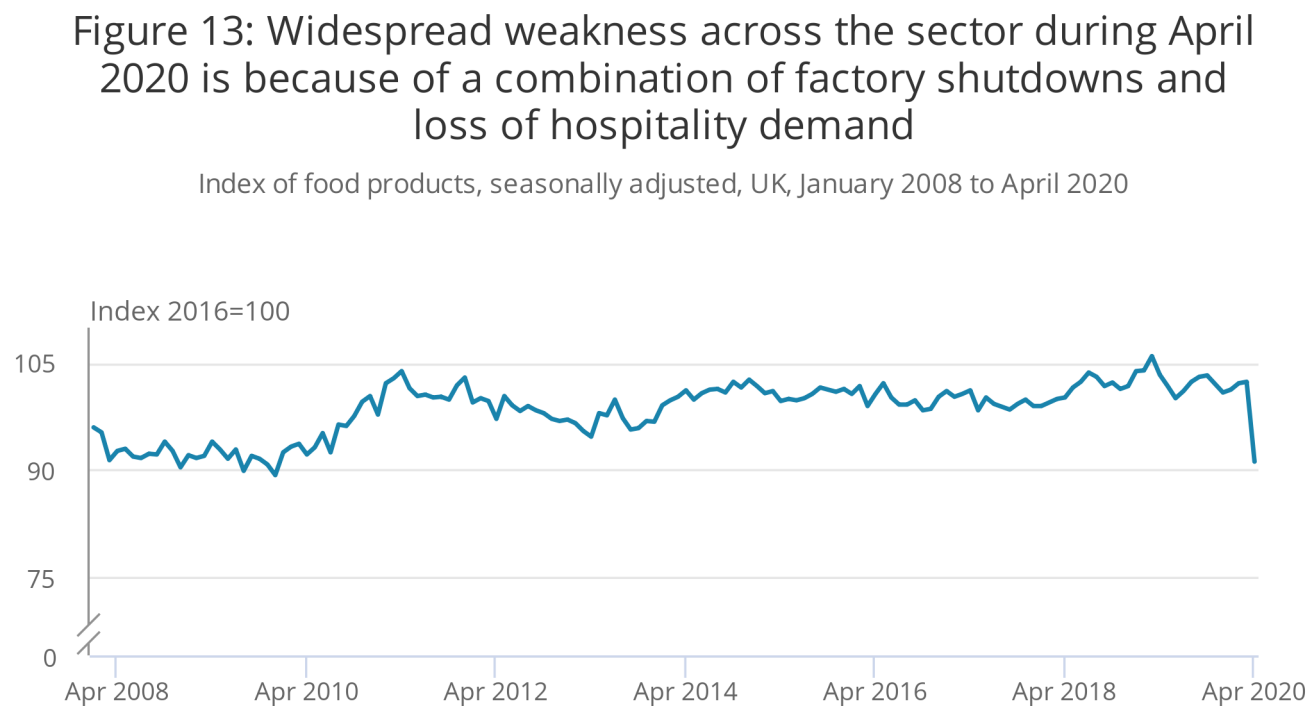
We also received evidence of strong demand from supermarkets, with businesses supplying this sector benefitting.

## Food products (Division 10)

Six of the eight sub-industries within this sector fell on the month, despite a rise in consumer led demand because of the public spending more time at home during the lockdown. We received evidence of severe disruption from businesses focussed on the hospitality sector who were unable to secure contracts elsewhere at short notice. We also received some evidence of falls following the panic buying peak during March, for example, grain mill products, starches and starch products (Division 10.6), which fell by 7.6% during April, because of lower demand for pasta, rice and flour.

**Figure 13: Widespread weakness across the sector during April 2020 is because of a combination of factory shutdowns and loss of hospitality demand**

**Index of food products, seasonally adjusted, UK, January 2008 to April 2020**




**Source: Office for National Statistics – Index of Production**

**Notes:**

1. We would advise users to be mindful of a break in the side axis when interpreting this chart.

## Rubber and plastics products, and other non-metallic mineral products (Sector CG)

The significant fall of 40.0% is because of record falls from all three sub-industries. Within rubber and plastic products (Division 22), there was some evidence that the production of personal protective equipment (PPE) boosted turnover, but this was overcome by the overall impact from lockdown restrictions and a lack of demand from related industries such as motor vehicles, trailers and semi-trailers.

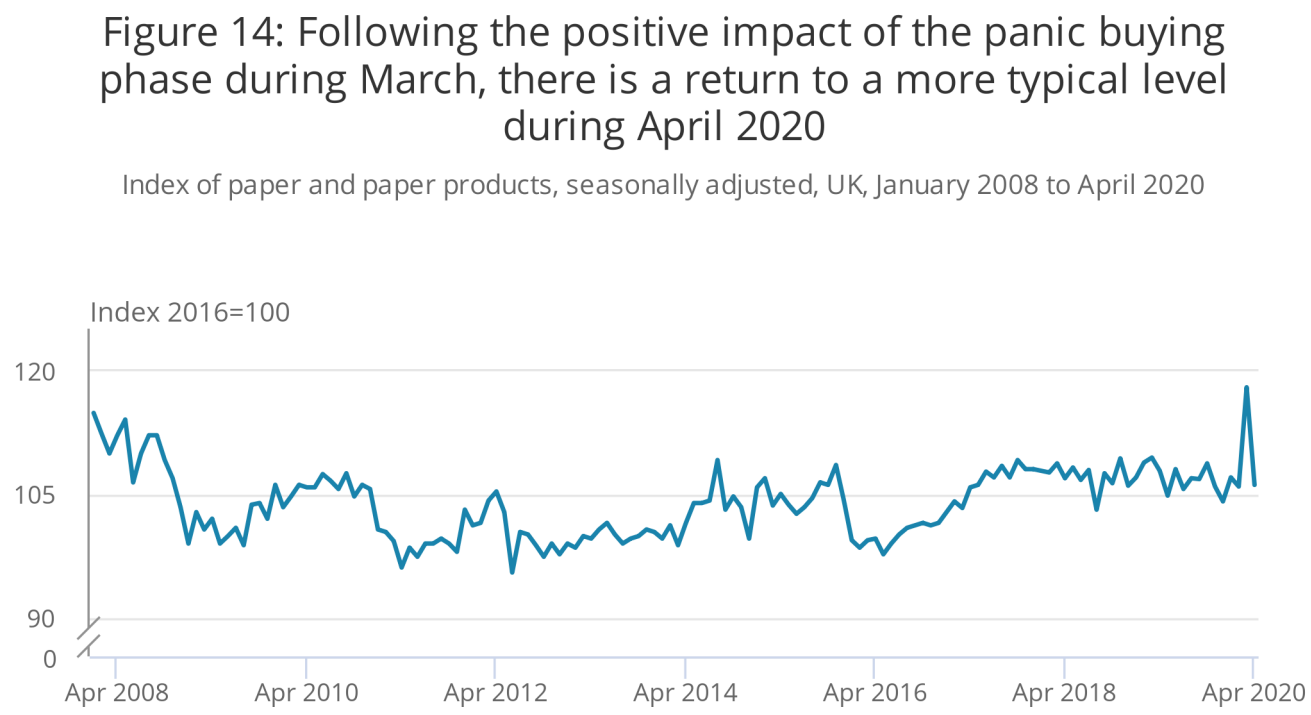
The two remaining sub-industries were both impacted by a large fall in construction output. Additional evidence from our Business Impact from Coronavirus Survey (BICS) confirmed that responders surveyed and classified within the glass, refractory, clay and stone products sub-industry (Division 23.5-6), reported that turnover was "outside of normal expectations".

## Paper and paper products (Division 17)

The fall of 10.0%, saw this industry return to more normal levels, following the significant positive effect on this sub-industry from the "panic buying" phase during March 2020, highlighted in last month's March 2020 article.

**Figure 14: Following the positive impact of the panic buying phase during March, there is a return to a more typical level during April 2020**

**Index of paper and paper products, seasonally adjusted, UK, January 2008 to April 2020**




**Source: Office for National Statistics – Index of Production**

**Notes:**

1. We would advise users to be mindful of a break in the side axis when interpreting this chart.

## Other manufacturing (Division 32)

This sub-industry fell by a record 19.4%. This was mainly because of a general fall in NHS demand (for example, ophthalmology and dental equipment) as well as veterinary equipment. Despite some isolated evidence from responders of a positive impact on turnover from the provision of PPE and medical equipment, such as ventilators, this part of the industry also declined.

### Building of ships and boats (Division 30.1) and air, spacecraft and related machinery (Division 30.3)

The fall in both industries is more evident than normal because of a change in method (see section 5 for an explanation on this change of methodology).

We received responder led evidence of a negative impact on aircraft production, related to the collapse of the air travel industry worldwide.

As highlighted in last month's article, some responders continued to diversify by producing PPE and ventilators, while some have continued air transport solutions for the provision of PPE.

### Textiles, wearing apparel and leather products (Sector CB)

This sector had a significant fall of 49.6%, led by record falls across all three sub-industries mainly because of many responders reporting zero turnover, including 36% of all responses within wearing apparel (Division 14). Our BICS survey confirmed this weakness, as a significant number of responders within wearing apparel, which fell by 52.3% and leather products (Division 15), which fell by 59.2%, reported that their turnover was "outside of normal expectations".

### Basic pharmaceutical products (Division 21)

This was the only manufacturing subsector that displayed upward growth (4.7%) and continues strong performance over recent months. There was evidence of increased activity around Covid-19 treatment, vaccines and testing but of more note during April 2020, was higher demand for general pharmaceutical products, with strong growth in domestic facing output.

### Electricity and gas (Sector D)

Despite much of the UK population spending more time in their homes because of a full month of lockdown restrictions, the fall of 9.5% at sector level was driven by a fall in electricity supply. This fell by 11.7%, mainly because of less demand from industry, which outstripped the increase in domestic use.

### Water and waste (Sector E)

The sector level fall of 5.3% is led by a 13.5% fall from waste collection, because of a decline in industrial commercial waste, resulting directly from factory closures during April.

This article is the second analysis of the impact of the coronavirus (COVID-19) pandemic on official output data. Our monthly outputs will continue to be closely monitored and quality assured. Monthly data for May 2020 will be published on 14 July 2020. If you have any comments or feedback on this article, please contact indexofproduction@ons.gov.uk.

## 5 . Data collection and sources

The Monthly Business Survey (MBS) is the primary data source for 75% of production industries and 50% of services industries. This is an online questionnaire where businesses are asked to provide their turnover, and export turnover if they are within manufacturing.

## Effects of coronavirus (COVID-19) on the data

During lockdown it has proven more challenging to collect the information required to produce the MBS. Although survey responses have inevitably declined there are no significant concerns surrounding data quality for April 2020.

The first government advice on social distancing was published on 12 March 2020 before a formal "lockdown" was announced on 23 March 2020. These inevitably led to a fall in consumer demand and business and factory closures, which further complicated the existing supply chain issues that had already begun to appear.

A comments box is available for businesses to describe issues impacting turnover and we use this responder-led evidence to validate industry movements. For April 2020 we received more than 15,000 comments across the MBS compared to 1,500 in February 2020, most commonly referring to a fall in turnover due to the coronavirus (COVID-19) pandemic.

## Other data sources

Other data are primarily sourced from the Office for National Statistics (ONS) (for example, government expenditure, households' expenditure, and finance expenditure), but also other bodies such as the Department for Transport, the Civil Aviation Authority and the Department for Business, Energy and Industrial Strategy (BEIS). These account for 50% of services industries and 25% of production industries. We are also able to gain intelligence from these data providers regarding monthly changes in their data.

## Volatility

Care should be taken when using the month-on-month movements as data can be volatile; longer-term growth rates and examination of the time series allow for better interpretation of the statistics. Shorter time series, including those for the construction industry, which only began in 2010, are implicitly more volatile.

## Survey response - production and services industries

The Monthly Business Survey (MBS) is an online questionnaire and is the primary data source for 75% of production industries and 50% of Services Industries. During the pandemic it has proven more challenging to collect the information required, due in part to the furloughing of staff who would normally complete the questionnaires.

The services industries overall response rate for April 2010 compare favourably with similar periods at 84.4% response by turnover compared with 87.1% in January 2020 (Historic Monthly Business Survey (services) response rates).

For production industries the overall response rates are down slightly on previous periods at 78.8% response by turnover compared with 84.8% in January 2020 (Monthly Business Survey (production) response rates). This has primarily been caused by a comparatively lower response from larger businesses.

The negative impact has generally been greater for newly selected and small businesses. At industry level we have generally seen a negative impact on response rates where a higher proportion of businesses have ceased trading on a permanent or temporary basis.

It must be noted that lower response rates are not directly indicative of lower quality estimates as the impact can be overcome by the quality of the imputation for the industry. However, lower response rates may indicate heightened risk surrounding imputation.

There are a number of industries where response has fallen to well below average levels in April 2020 and these include meat and meat products, soft drinks, leather and related products, printing and reproduction of recorded media, fabricated metal products, furniture, other manufacturing, motor trades, telecommunications and veterinary activities. However, we have also seen response levels at above average for April 2020 in dairy products, dyestuffs and agro-chemicals, basic pharmaceuticals, repair and maintenance of aircraft, publishing activity, accountancy and personal services.

We have also improved the presentation of response rates. These have historically focused on the response achieved for each month at the time of first publication. We have now included additional data showing how these improve over time. For example, March 2019 services response by turnover increased from 82.4% at first publication, Month 1, to 96.5% at Month 3 and 98.5% at Month 13. Survey returns are not updated after 13 months as MBS is not revised after this point. Next month we will publish updated response for the services and production industries for March 2020, which have already improved to 87.5% and 83.4% respectively since first publication last month.

## Survey response - construction industry

For construction industries in April 2020 the response by turnover was 65.6% compared with 79.0% in January 2020. Until March 2020, a paper questionnaire was used for the survey and the response rates were impacted by furloughed staff being unable to complete the questionnaire for that month, in addition to some business respondents working from home and being unable to complete the paper questionnaire delivered to their work address. The April 2020 survey has moved online to alleviate this issue and the response rate has increased from the 54.4% in March. It is hoped that response rates will rise as businesses continue to move online. Since the last publication the response by turnover for March has increased from 54.4% to 68.4%. The impact from this additional data will be published in the quarterly national accounts update to be published on June 30.

## Impact of business closures

Many businesses have ceased trading because of the impact of the coronavirus (COVID-19) pandemic, either on a permanent or temporary basis. This will have impacted upon survey response rates for April 2020 and inactivity rates will impact on future months with increasing pressure on response rates.

We have seen evidence of increased inactivity during April 2020 by analysing nil turnover returns. In the services industries, a consistent 6.0% of business returns to the MBS were nil between January and March 2019 and also in January and February 2020. In March 2020 this increased to 7.2% and in April 2020 it increased to 16.4%. In the production industries nil turnover returns were similarly a consistent 3.4% between January and March 2019 and January and February 2020. In March 2020 they increased to 4.4% and in April 2020 to 11.9%. In construction nil turnover returns were a fairly consistent 7% between January 2019 and March 2019. In March 2020 they increased to 12.7% and in April 2020 to 42.5%.

Updates to the ONS Inter-Departmental Business Register from HM Revenue and Customs will deliver the most authoritative medium-term impact on business demographics and activity rates. For the timeliness of these outputs, we have had to focus on information provided by businesses to both the MBS and the Business Impact of Coronavirus (COVID-19) Survey (BICS).

We have used comments from BICS and the March MBS to construct additional nil turnover returns for businesses that have ceased trading for April where these have been non-responders to the survey.

## Methodological changes

Average weekly earnings (AWE) are used in a number of areas across the services industries as a proxy for output price data, see the GDPO source catalogue, but is not available for April. The data source is a sub-optimal proxy for changes in output prices as it only reflects wage impacts from input prices.

Given the expected impact on AWE from furlough arrangements, where furloughed or non-productive staff will continue to be part of payroll and counted within AWE, we have reviewed the suitability of using AWE as an appropriate proxy for output prices. On a temporary basis we have instead used the headline growth in the Consumer Price Index less the effect of indirect taxes (CPIY). This treatment will be reviewed in future months.

For social work activities without accommodation we currently use government expenditure on social protection as a proxy for all activity in the industry. This does not adequately represent activity in the market sector, and specifically for child day-care activities. For April we have adjusted our estimates on the basis that 95% of child day-care activities had ceased. We will continue to review our adjustments and estimates for this industry.

The manufacturing industries have traditionally used statistical programs to adjust industries that have been prone to volatility, and where inventory movements had traditionally played a significant role in measuring production output before these were removed more than ten years ago. In our previous dataset the aircraft production, shipbuilding and railway production (part of other transport equipment) industries were all smoothed using standard X-13 models to overcome volatility in reported sales.

Given the falls evident in April and the expected future pressure on these industries during 2020 we have suspended smoothing, reverting to our standard measurement procedures from January 2020. This will allow us to more accurately present monthly movements in these industries while introducing more volatility to manufacturing estimates.

## Forecasting

There is always a trade-off between the timeliness of our published estimates and the availability of data. With the publication of April 2020 data some sources are not available as normal and these have been forecasted using standard ONS methodology and practice.

These inevitably include quarterly data from the ONS expenditure approach to the measure of gross domestic product (GDP) (government expenditure from HM Treasury, households' expenditure from the ONS Living Costs and Food Survey, and finance expenditure primarily from the Bank of England) where we are using initial informed estimates from ONS suppliers.

While as this stage these data are predominantly based on forecasts, we have used a wider range of data to inform our judgements around these.

We have used the COBR report to help model ferry data in the water transport industry and passenger data in the rail transport industry while we await our normal delivery of quarterly data from the Department for Transport.

The independent schools component of the education industry is measured using annual data from the Independent Schools Council, which requires the use of forecast data for the second quarter of 2020. We have modelled the forecast to enable us to mirror the movement in government-funded schools.

Workforce jobs data for the second quarter of 2020 is not yet available. For mining support services, we have modelled data from oil and gas extraction. For membership organisations we have modelled data from the experimental series of weekly hours worked for the whole economy, assuming that the hours worked in the final week of March 2020 continued during April.

## Changes in products produced by businesses

Comments received as part of the MBS have made clear that businesses have begun to change their product and service mix due to the coronavirus (COVID-19) pandemic. Within the manufacturing industries this has particularly focused on, for example, medical equipment, personal protective equipment (PPE) and hand sanitisers by businesses previously unfamiliar with the manufacture of those products.

Businesses can often change the make-up of their products and services and as a consequence it is challenging to keep pace with these changes in the short-term. We capture these changes through the Annual Survey of Goods and Services, which provides product breakdowns of each industry.

## Methodological review

A review of the appropriateness of our seasonal adjustment models has been conducted by experts at the ONS, covering the entire construction, production and services industries. A further review will be conducted for May 2020 estimates.

Methodology experts at the ONS have closely reviewed the imputation methodology used for businesses that have not responded to the MBS. They have concluded that imputation methodology is being applied appropriately.

## Revisions

Revisions are an inevitable consequence of publishing on a timely basis as more data become available, including higher response rates to surveys. Users should be aware that during periods of significant data volatility it is possible that revisions may be greater than normal. These can be tracked through revisions triangles published alongside the appropriate bulletins and will be featured in articles and bulletins where appropriate. There are no revisions published within the datasets released today. The UK quarterly national accounts will be published on June 30 and will include revisions from January 2019.

# 6 . Related links

GDP monthly estimate, UK: April 2020
Bulletin | Released 12 June 2020
Gross domestic product (GDP) measures the value of goods and services produced in the UK. It estimates the size of and growth in the economy and includes the Index of Production (IoP), Index of Services (IoS) and construction output in Great Britain.

Coronavirus and the latest indicators for the UK economy and society: 11 June 2020
Article | Released 11 June 2020
Early experimental data on the impact of the coronavirus (COVID-19) on the UK economy and society. These faster indicators are created using rapid response surveys, novel data sources and experimental methods.

Coronavirus (COVID-19) roundup
Article | Updated as and when data become available
Catch up on the latest data and analysis related to the coronavirus (COVID-19) pandemic and its impact on our economy and society.

Coronavirus (COVID-19) latest data and analysis
Web page | Updated as and when data become available
Latest data and analysis on the coronavirus (COVID-19) in the UK and its effect on the economy and society.

Coronavirus and the effects on UK GDP
Article | Released 6 May 2020
How the global coronavirus (COVID-19) pandemic and the wider containment efforts are expected to impact on UK gross domestic product (GDP) as well as some of the challenges that National Statistical Institutes are likely to face.

Meeting the challenge of measuring the economy through the COVID-19 Pandemic
Blog | Released 6 May 2020
A blog looking at new challenges we face in terms of data collection during the coronavirus (COVID-19) pandemic.