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England

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Impact of COVID-19 on childhood vaccination counts to week 17 in 2021, and vaccine coverage to March 2021 in England: interim analyses

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Main points

This series of reports presents an assessment of the extent of COVID-19-related impact on childhood vaccinations based on both (a) aggregated vaccine counts of dose 1 Hexavalent and dose 1 MMR vaccinations delivered to infants or children and (b) vaccine coverage data for dose 1, 2 and 3 Hexavalent and dose 1 MMR vaccines extracted from ImmForm.

This sixteenth report, that includes vaccination counts data up to week 17 in 2021, and vaccine coverage data up to the end of March 2021.

Vaccination counts

Vaccination counts for the first dose of Hexavalent (DTaP/IPV/Hib/HepB) in children aged 6 months and the first dose of MMR (Measles, Mumps, Rubella) in children aged 12 to 18 months were extracted from The Phoenix Partnership, which represents data from approximately 38% of GP practices in England. Vaccination counts to April indicate that:

- Hexavalent and MMR vaccination counts fell at the time of introduction of physical distancing measures in March 2020 (week 13) compared to the same period in 2019. This was followed by a rise from weeks 16 onwards which has stabilised and is comparable to vaccination counts prior to the COVID-19 pandemic
- in 2020, vaccination counts continued to stabilise, though there have been slightly lower vaccination counts throughout the tiered restriction periods (weeks 43 to 45) and during the second national lockdown in autumn 2020 through to winter 2021 (week 45 onwards)
- in 2021, overall vaccination counts for Hexavalent and MMR vaccine remain lower at 8.3% and 17.4% higher on week 17 in 2021 compared to week 17 in 2019. Whereas, vaccination counts were 2.0% and 1.3% higher during week 17 in 2021 compared to week 17 in 2020, respectively

Early vaccine coverage

Early vaccine coverage data uploaded on ImmForm is extracted at 6 months of age to assess vaccine coverage for Hexavalent vaccine doses 1 to 3, and at 18 months to assess vaccine coverage for MMR1. Vaccine coverage data extracted from ImmForm up to and including March 2021 indicates that:

- 87.3% of infants completed the 3-dose course of Hexavalent vaccine by 6 months of age – this is 0.8 and 1.3 percentage points lower compared to March 2019 and March 2020, respectively. Data extracted between November 2020 and March 2021 showed a fall in infants receiving Hexavalent dose 1 compared to monthly extracts from August to October 2020
- it should be noted that routine coverage for most of the primary schedule vaccines at the national level had declined slightly in each of the 6 years 2012-13 to 2018-19, recovering marginally in 2019-20 [1,2]
- the current decrease in early coverage could at least partly be attributable to the COVID-19 pandemic
- for children scheduled to receive MMR1 vaccine from March 2020 onwards, vaccine coverage measured at 18 months of age remains approximately 86.0%. In March 2021, 86.4% of infants were vaccinated with MMR1 at 18 months of age – this is 0.8 and 1.8 percentage points lower than March 2019 and March 2020, respectively. The WHO coverage target for MMR1 is 95% coverage by 24 months

All children who have missed out on their routine vaccinations during the COVID-19 pandemic, remain eligible for their vaccines. As physical distancing and lockdown measures change throughout the course of the pandemic, it is possible that there may be further impact on primary immunisations. It is therefore important for General Practitioners and local teams to continue offering routine immunisations, check that any infants or children impacted during the pandemic are rescheduled for their immunisation and, where required, consider implementing catch-up or recovery plans.

Official vaccine coverage estimates for England reflecting coverage through the COVID-19 pandemic will be assessed in the COVER (Cover of vaccination evaluated rapidly) when children reach their first, second, or fifth birthday [3].

Introduction

On 23 March 2020 (week 13), in response to the COVID-19 pandemic, physical distancing measures were introduced in England which included school closures, stopping gatherings, non-essential use of public transportation and individuals being advised to work from home [4,5]. Advice from the Joint Committee on Vaccination and Immunisation (JCVI) on routine childhood immunisations stated that children should continue to receive vaccinations according to the national schedule throughout the lockdown [6]. Furthermore, on 14 October 2020 (week 42), a 3-tier approach was introduced where different regions in England were assigned varying according to defined tiers and from 5 November (week 45), England returned to nationwide lockdown [7]. On 2 December, the national lockdown ended, and the local 3-tier approach was reinstated across the country [8]. However, with the emergence of a new variant of COVID-19 and increases in cases and hospital admissions, the nation returned to lockdown on 5 January 2021 [9].

In England, childhood immunisations are offered according to the routine immunisation schedule [10]. Childhood vaccine coverage is routinely assessed in quarterly and annual COVER (Cover of vaccination evaluated rapidly) programme reports for children who reached their first, second, or fifth birthday [11,12]. The COVER reports display the official vaccine coverage estimates for England. The most recent quarterly **COVER report** reflects includes Hexavalent vaccine coverage at 12 months for cohorts born in October to December 2019 and, therefore, eligible for primary immunisations slightly before the time when the COVID-19 pandemic started in England. The recent quarterly COVER reports state that a contributing factor to the observed decreases in coverage, for some vaccines, in some areas presented in the may be due to some children who, having missed some of their routine immunisations when first scheduled but who otherwise might have caught up by their first, second or fifth birthday, having been impacted by the lockdown and/or local restrictions from late March 2020 onwards [1,2,3].

Due to the timing of data extractions for the COVER collection in relation to age cut off dates, it is not possible to fully assess the impact of COVID-19 on primary immunisations of infants and children in a timely manner.

The purpose of this report therefore is to provide an interim analysis using alternative data sources to assess the impact of COVID-19 on primary immunisations in England at a younger age than the routinely collected data. To evaluate the early impact of COVID-19 on the delivery of childhood vaccinations, 2 datasets have been analysed:

1. An assessment of aggregated weekly vaccination counts from 2019, 2020 and 2021 for dose 1 Hexavalent (Diphtheria, Tetanus, Pertussis (whooping cough), Polio, Haemophilus influenzae type b (Hib) and Hepatitis B) delivered to infants 6 months and younger and MMR1 (first dose of Measles, Mumps and Rubella vaccine) to children between the ages of 12 and 18 months provided by the GP IT supplier The Phoenix Partnership (TPP)¹.
2. An early assessment of national vaccine coverage from aggregated GP vaccine coverage data for dose 1, 2 and 3 of Hexavalent vaccines at 6 months, and MMR1 at 18 months, collected monthly via ImmForm². The ImmForm coverage data provides interim estimates of vaccine coverage ahead of the official COVER statistics covering cohorts impacted by COVID-19, assessed at 12 and 24 months of age.

This report will summarise vaccination counts for dose 1 Hexavalent and MMR1 updated weekly from TPP in 2021 compared to 2019 and 2020 for the age groups stated above. This report will also summarise vaccine coverage extracted up to March 2021 for dose 1, 2 and 3 of Hexavalent vaccine at 6 months compared to coverage in 2019 and 2020, and vaccine coverage up to March 2021 for dose 1 MMR at 18 months compared to 2019 and 2020.

Target audience

This report is aimed for those who monitor and support the routine immunisation programme in England at both a local and national level.

¹ TPP supplies SystmOne which is an electronic patient record used by more than 2,600 primary care practices in the UK

² ImmForm is the system used by Public Health England to record vaccine coverage data for some immunisation programmes and to provide vaccine ordering facilities for the NHS

Methods

The Hexavalent and MMR vaccines were selected for these analyses as a proxy for routine primary immunisations scheduled before 1 year of age and immunisations scheduled from 1 year of age, respectively, to provide an initial indication of the impact of COVID-19 on all primary immunisation programmes.

Monitoring weekly vaccination counts provided by TPP

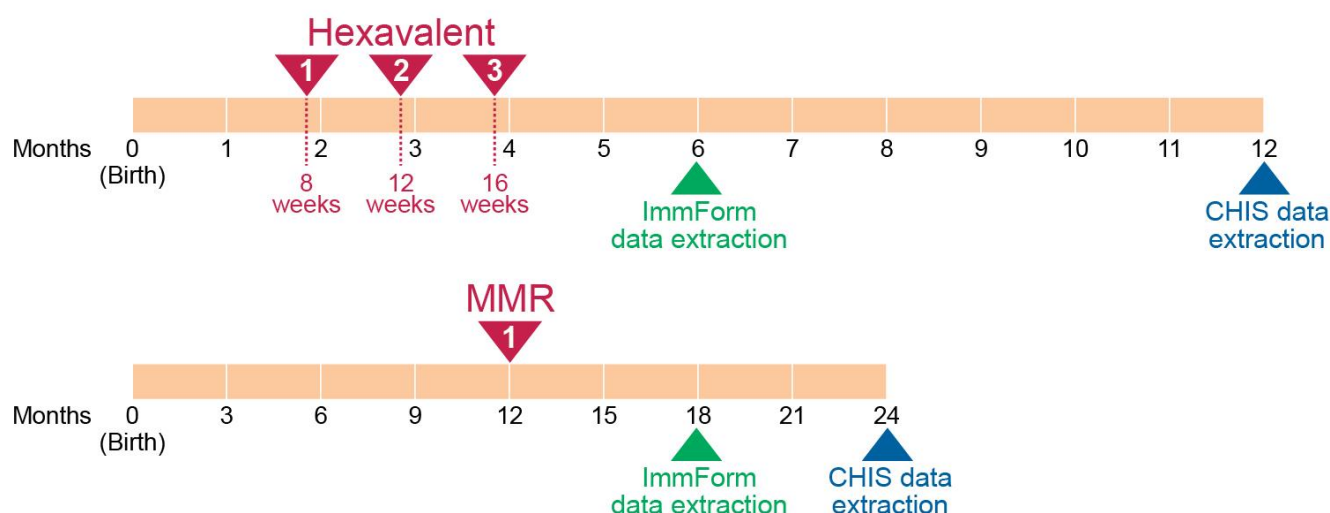
Aggregated weekly counts of the dose 1 Hexavalent delivered to infants 6 months and younger and dose 1 MMR to children between the ages of 12 and 18 months were provided by TPP for all weeks in 2019, 2020, and the first 17 weeks of 2021. Weekly trends in vaccination counts were compared between 2019, 2020 and 2021.

Early monitoring vaccine coverage

GP practice-level vaccine coverage data, automatically uploaded via participating GP IT suppliers to the ImmForm website on a monthly basis, was used to provide an early assessment of vaccine coverage for some of the routine childhood vaccinations. This data is validated and analysed by PHE to check data completeness, to identify and query any anomalous results, and to describe epidemiological trends. Vaccine coverage is calculated as the number of infants reaching a target age and receiving a vaccine(s) as a proportion of the total number of infants at the target age registered at the GP practice.

Vaccine coverage estimates were extracted from ImmForm on a monthly basis for all children who reached 6 months or 18 months of age in that calendar month. Vaccine coverage estimates for Hexavalent vaccines 1, 2 and 3 were estimated when children reached 6 months of age, whilst vaccine coverage estimates for MMR1 were estimated when children reached 18 months of age. Vaccine coverage estimates for a different cohort of children were therefore extracted each month. To assess the potential impact of COVID-19, we compared vaccine coverage data extracted from ImmForm for 2019, 2020 and 2021. **Figure 1** shows the recommended scheduled timing of the Hexavalent dose 1, 2 and 3, and MMR1 vaccinations, and compares the timing of the ImmForm and CHIS extractions.

Figure 1. Timeline from when infants are scheduled for their first, second and third dose of hexavalent vaccine and first dose of MMR vaccine and the time when ImmForm and CHIS data are extracted.



Tables A1 and A2 (Appendix) show how ImmForm and CHIS data extracted and relate to the recommended schedule for Hexavalent and MMR1 vaccines. If COVID-19 had impacted vaccine delivery in a specific calendar month, this would be reflected in the Immform data in different months depending on the particular vaccines effected. For example, if COVID-19 had impacted vaccinations scheduled in April 2020, we would expect to see this reflected in the ImmForm data in June 2020 for Hexavalent dose 3, July 2020 for Hexavalent dose 2, August 2020 for Hexavalent dose 1 and October 2020 for MMR1 (Tables A1 and A2).

Results

Vaccination counts provided by TPP

TPP represents approximately 38% of data for all practices in England. By week 17, vaccination counts from TPP general practices in 155 CCGs, that were in operation in from 2019 to 2021, were extracted and are shown in Table 1.

Table 1. Vaccination counts for Hexavalent and MMR vaccines in 2019, 2020 and 2021*

Vaccine	Cumulative counts to week 17 2019	Cumulative counts to week 17 2020	Cumulative counts to week 17 2021
Dose 1 Hexavalent	68,351	60,872	60,563
Dose 1 MMR	67,685	60,014	61,742

*Please note week 1 in 2021 only included 3 days as 2020 had 53 weeks

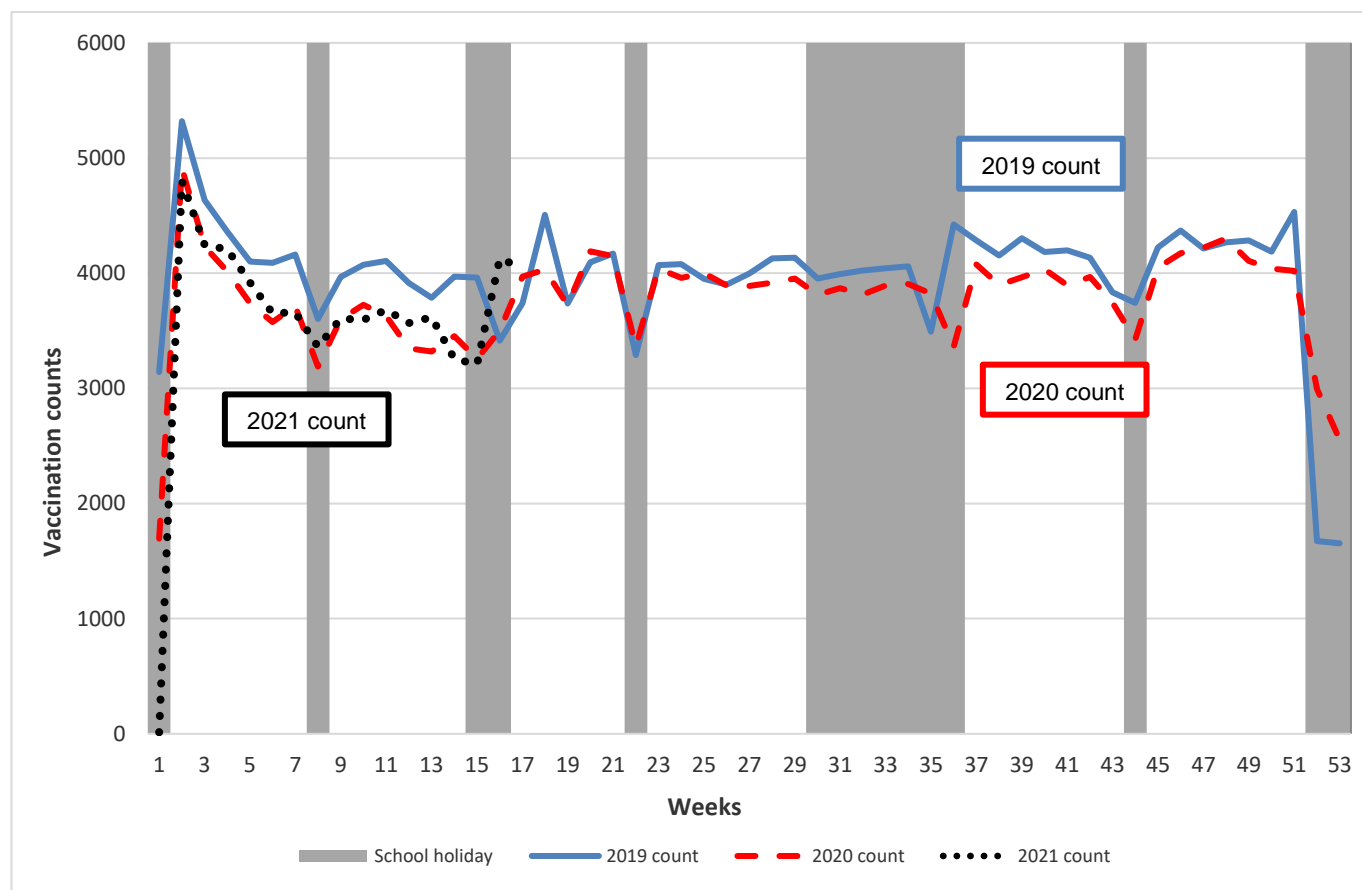
The weekly data (Figures 2 to 5) shows that for both Hexavalent 1 and MMR 1, vaccination counts decreased substantially in the first weeks after the introduction of physical distancing compared to the same period in 2019 (weeks 13 to 15). Vaccination counts then increased in 2020 (weeks 16 and 17) despite physical distancing measures remaining in place [1].

Since week 17, in 2020, vaccination counts for both MMR1 and Hexavalent remained stable with no indication of sudden drops in immunisations delivered during the tiered restrictions (weeks 43 to 45) or during the introduction of the second national lockdown (weeks 45 onwards).

An increase in counts has been observed in Hexavalent coverage for week 17 in 2021 compared to the same week in 2019 and will continue to be monitored in upcoming weeks. Overall vaccination counts for dose 1 Hexavalent and MMR1 vaccines remain lower since the pandemic than the 2019 counts (Figure 4 and 5), though direct comparisons for the weekly data between 2019, 2020 and 2021 should be made with caution since the days do not map the same weeks (week 1 data for 2021 only accounts for 3 days).

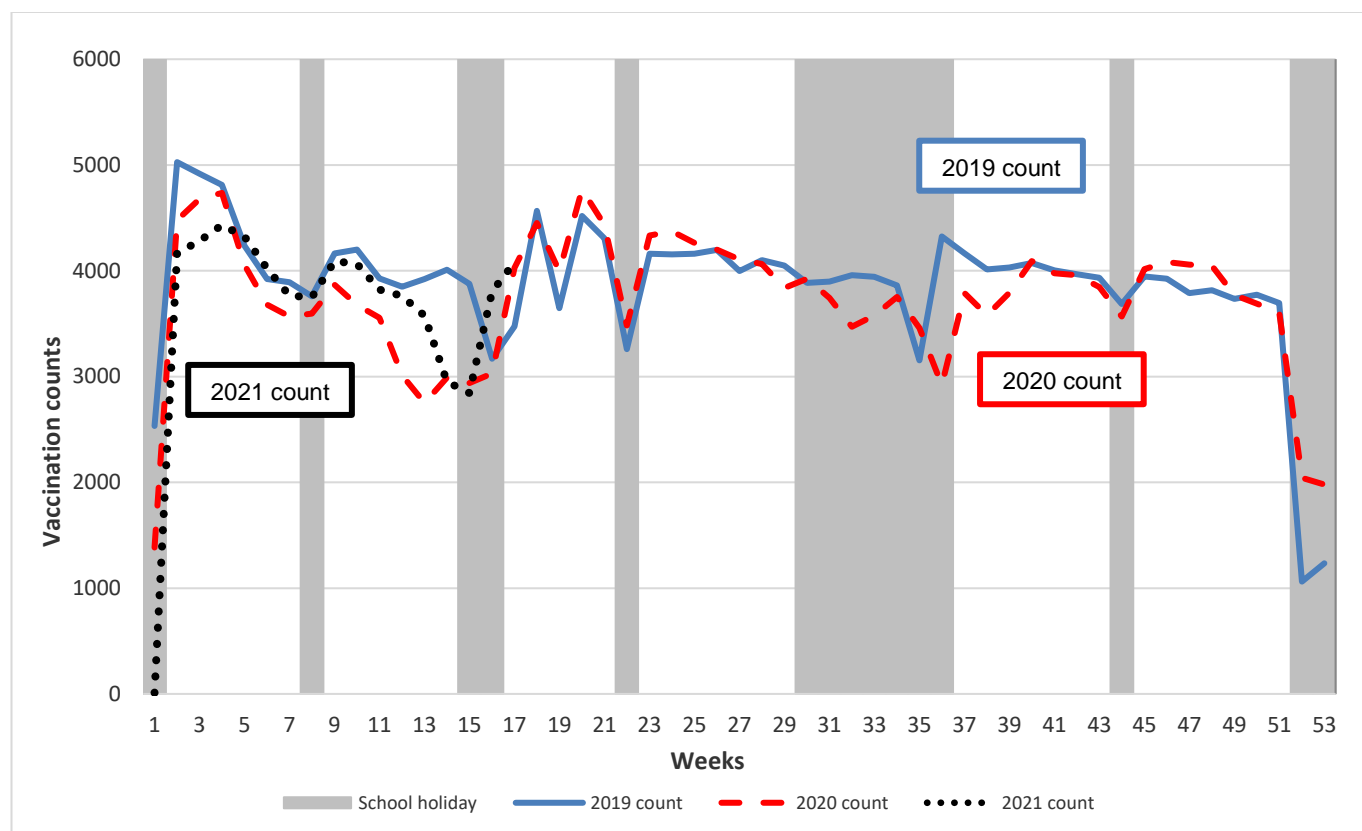
It is also important to note that school holidays and bank holidays occur in different weeks in 2019, 2020 and 2021, and therefore can cause weekly differences. Decreases in vaccination counts have been observed in 2019 and 2020 during school holidays, which may be in different weeks (Figures 2 to 5) and will likely be observed in 2021.

Figure 2: Weekly dose 1 Hexavalent vaccination counts in infants younger than 6 months in TPP practices open in both 2019 and 2020 or both 2019 and 2021 in England; 2019, 2020 and 2021*



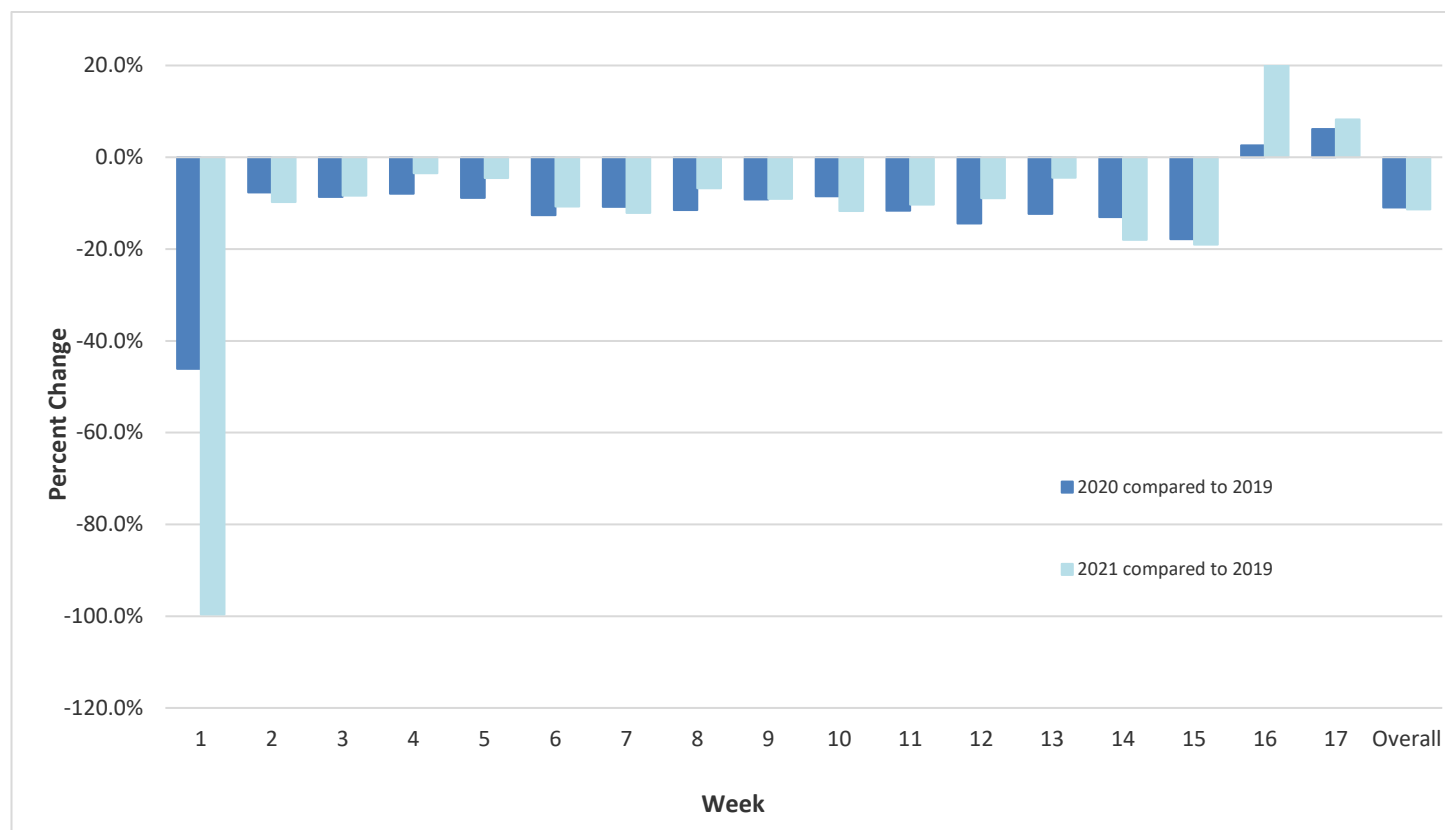
* School holidays (often coinciding with family holidays) for are for the 2020 calendar year. These holidays may vary slightly by year and by local area. School holidays for the 2019 to 2020 academic year were in weeks 43, 52, 53, 1, 8, 15, 16, 19, 22, 30 to 36. School holidays for the 2020 to 2021 academic year are in weeks 44, 52, 53, 7, 13, 14, 18, 22, 29 to 35.

Figure 3: Weekly dose 1 MMR vaccination counts in infants ages 12 to 18 months in TPP practices open in both 2019 and 2020 or both 2019 and 2021 in England; 2019, 2020 and 2021*



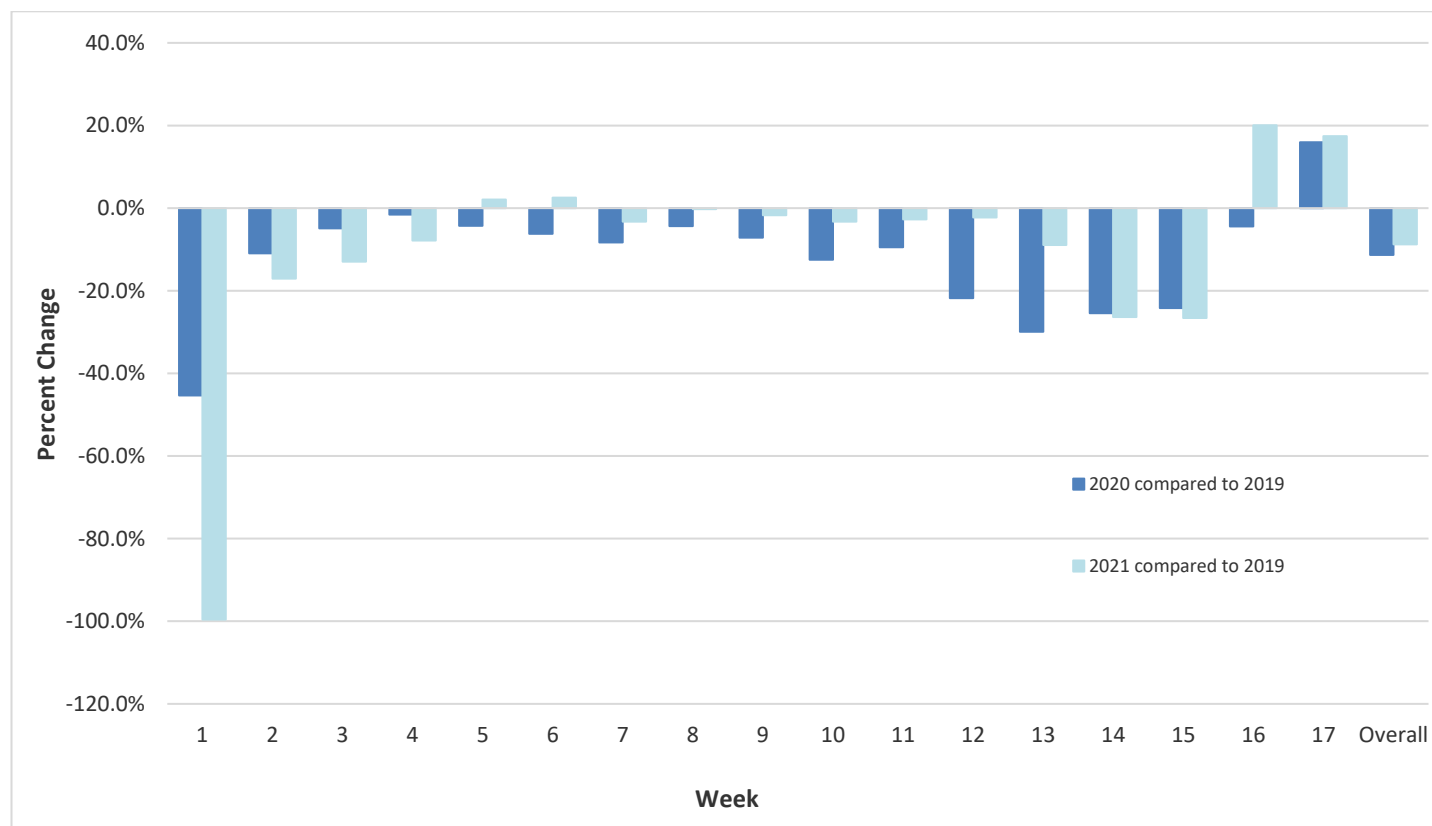
* School holidays for are for the 2020 calendar year. These holidays may vary slightly by year and by local area. School holidays for the 2019 to 2020 academic year were in weeks 43, 52, 53, 1, 8, 15, 16, 19, 22, 30 to 36. School holidays for the 2020 to 2021 academic year are in weeks 44, 52, 53, 7, 13, 14, 18, 22, 29 to 35.

Figure 4: Percent change in dose 1 Hexavalent (in infants under 6 months) counts in 2021 compared to 2019 and counts in 2020 compared to 2019, by week in TPP practices open in 2019, 2020 and 2021 in England



* Direct comparisons for the weekly data between 2019, 2020 and 2021 should be made with caution since the days do not map the same weeks (week 1 data for 2021 only accounts for 3 days, whereas January 2020 had 5 days and January 2019 had 6 days)

Figure 5: Percent change in dose 1 MMR 1 vaccination (in infants ages 12 to 18 months) counts in 2021 compared to 2019 and counts in 2020 compared to 2019, by week in TPP practices open in 2019, 2020 and 2021 in England



* Direct comparisons for the weekly data between 2019, 2020 and 2021 should be made with caution since the days do not map the same weeks (week 1 data for 2021 only accounts for 3 days, whereas January 2020 had 5 days and January 2019 had 6 days)

Early vaccine coverage assessment in England

Monthly vaccine coverage data are available on ImmForm for at least 92% of general practices since January 2019, and for more than 95% of practices for most of this period.

Hexavalent Vaccine

Comparing early vaccine coverage estimates monthly from 2019 to March 2021 shows there has been a decrease in vaccine coverage measured at 6 months of age for Hexavalent doses 1, 2 and 3 since April 2020 ([Table 2](#)). Of the 3 vaccine doses, the largest percentage decrease is seen in Hexavalent 3 vaccine, though the percentage decrease has consistently diminished for all 3 doses since January 2021.

Table 2. Vaccine coverage for dose 1, 2 and 3 of the Hexavalent vaccine by survey month (extracted at 6-month age cohorts) in 2019, 2020 and 2021

Survey month	Hexavalent dose 1 (%)					Hexavalent dose 2 (%)					Hexavalent dose 3 (%)				
	2019	2020	Percent-age point difference 2020 compared to 2019	2021	Percent-age point difference 2021 compared to 2019	2019	2020	Percent-age point difference 2020 compared to 2019	2021	Percent-age point difference 2021 compared to 2019	2019	2020	Percent-age point difference 2020 compared to 2019	2021	Percent-age point difference 2021 compared to 2019
January	96.1	96.2	0.1	95.6	-0.5*	93.5	93.7	0.3	92.3	-1.2*	87.7	88.5	0.8	85.4	-2.3*
February	95.9	96.3	0.4	95.6	-0.3*	93.1	93.8	0.7	92.3	-0.8*	87.2	88.4	1.2	85.5	-1.7*
March	96.0	96.6	0.6	95.8	-0.2*	93.4	94.0	0.5	92.9	-0.5*	88.1	88.6	0.5	87.3	-0.8*
April	96.2	95.9	-0.3			93.9	92.4	-1.5			88.8	84.1	-4.7		
May	96.5	96.0	-0.5			94.3	92.0	-2.3			89.4	83.9	-5.5*		
June	96.2	95.8	-0.4			93.9	91.9	-2.0*			88.8	85.3	-3.5*		
July	96.4	95.6	-0.8*			94.0	92.4	-1.6*			89.1	86.5	-2.7*		
August	96.3	95.9	-0.4*			94.0	93.3	-0.7*			89.0	87.6	-1.4*		
Sept.	96.4	96.0	-0.4*			93.9	93.3	-0.6*			88.9	87.1	-1.8*		
Oct.	96.2	95.9	-0.3*			93.9	93.0	-0.9*			89.2	86.3	-3.0*		
Nov.	96.1	95.5	-0.6*			93.6	92.5	-1.1*			88.7	85.8	-2.9*		
Dec.	96.2	95.7	-0.6*			93.7	92.5	-1.3*			88.1	85.4	-2.7*		

* Indicates cohorts of infants scheduled to receive their vaccine from March 2020 onwards

Infants who were scheduled from 8 weeks of age for dose 1 Hexavalent vaccine in March 2020 onwards are reflected in the ImmForm vaccine coverage estimates at 6 months of age from July 2020 onwards. Hexavalent 1 coverage trends for 2020 and 2021 compared to 2019 are broadly similar, with the largest decrease of 0.8 percentage points seen in the July 2020 data for infants scheduled to receive this vaccine in March 2020 (Figure 6). This was followed by a decrease of 0.6 percentage points in the November and December 2020 data, compared to the same months in 2019. Vaccine coverage was 0.2 percentage points lower in March 2021 compared to March 2019 and 0.8 percentage points lower compared to March 2020 (Table 2, Figure 6).

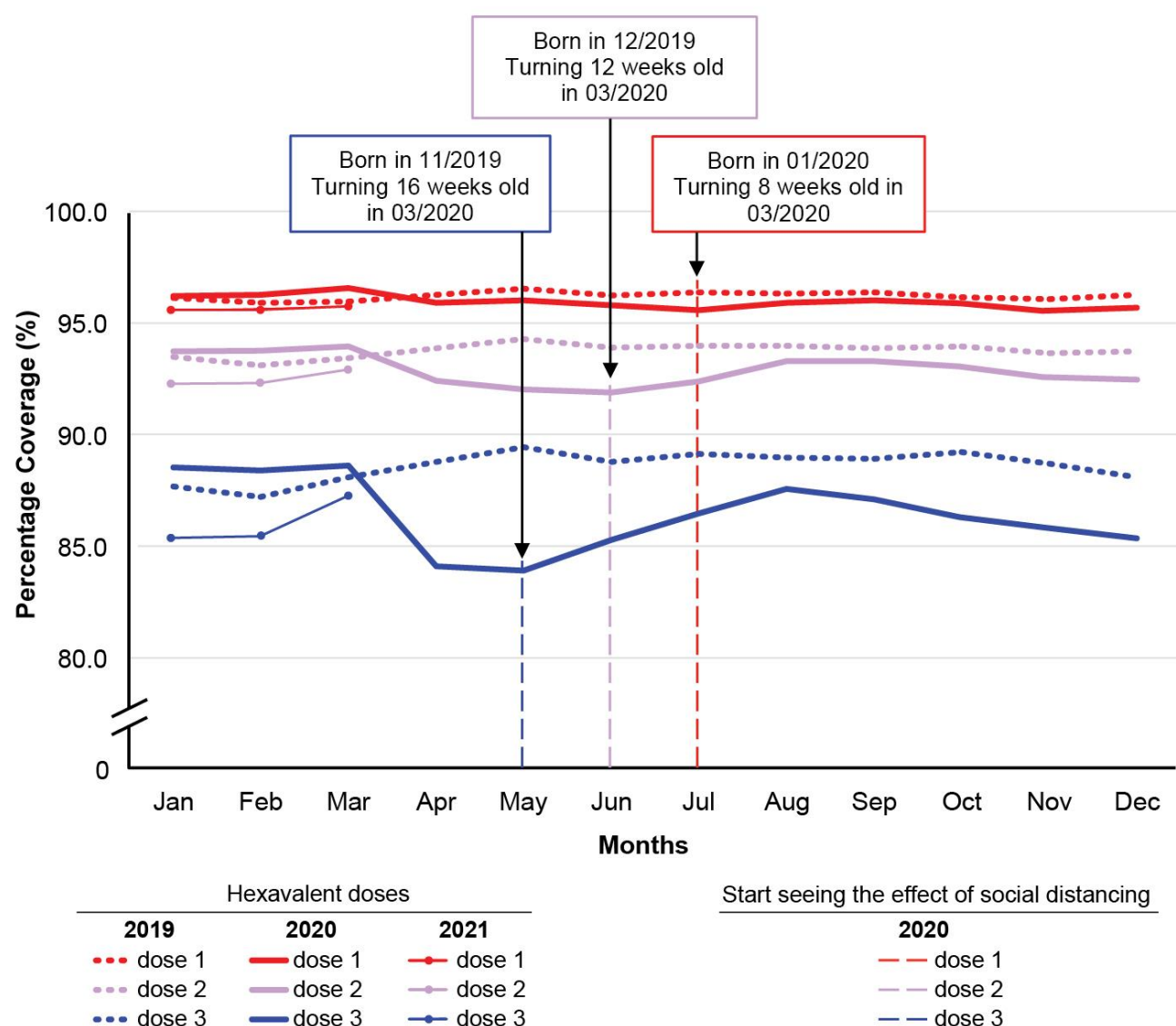
Infants scheduled from 12 weeks of age for dose 2 Hexavalent vaccine from March 2020 onwards are reflected in June ImmForm coverage data onwards. Vaccine coverage for dose 2 Hexavalent in June and July 2020 was lower than coverage estimates in June and July 2019, indicating that infants scheduled for their second dose of Hexavalent vaccine in March and April 2020 are likely to have been impacted by COVID-19 restrictions. Infants turning 6-months-old in the August to October 2020 extracts on ImmForm and who were scheduled for dose 2 Hexavalent in May and July 2020 appear less impacted by COVID-19 and their coverage was more aligned with the 2019 estimates (Figure 6). However, a slight decrease in coverage was observed between November 2020 and January 2021 data for infants scheduled to receive their second dose of Hexavalent vaccine from August to October 2020. Vaccine coverage was 0.5 percentage points lower in March 2021 compared to March 2019 and 1.0 percentage points lower compared to March 2020 (Table 2, Figure 6).

Infants scheduled from 16 weeks of age for dose 3 Hexavalent vaccine from March 2020 onwards are reflected in May 2020 ImmForm coverage data onwards. Vaccine coverage for dose 3 Hexavalent in May 2020 was substantially lower compared to coverage in May 2019, indicating that infants scheduled for their third dose of Hexavalent in March 2020 are likely to have been impacted by COVID-19 restrictions. Infants scheduled for dose 3 Hexavalent vaccine from April to July 2020 (turning 6-months-old in the June to September 2020 extracts on ImmForm, respectively) still appear impacted by COVID-19 though the percentage decrease is smaller than in previous months (Figure 6). Hexavalent coverage for dose 3 from September 2020 to January 2021 (infants scheduled for dose 3 Hexavalent in July through to November 2020) showed a downward trend in coverage. Vaccine coverage was 0.8 percentage points lower in March 2021 compared to March 2019 and 1.3 percentage points lower compared to March 2020 (Table 2, Figure 6).

Hexavalent coverage for dose 2 in April and May 2020 and for dose 3 in April 2020 was lower than coverage during these months in 2019. These coverage estimates largely reflect infants scheduled for their first hexavalent vaccine before the national lockdown in England was introduced in March 2020, indicating that these children may have missed their initial scheduled vaccination appointment, but were potentially unable to catch-up by 6 months of age as the social distancing measures began (Figure 6). Similarly, reduced completed course of the Hexavalent vaccine at 12 months was seen in the third quarterly COVER evaluation report (October to December 2020) among infants who were scheduled to receive first dose of

Hexavalent vaccine before the national lockdown and eligible for their second and third doses when the social distancing measures were still in place. Decreased coverage may reflect those who missed or otherwise delayed that opportunity.

Figure 6: Vaccine coverage for dose 1, 2 and 3 of the Hexavalent vaccine by survey month in 2019, 2020 and 2021



MMR1 Vaccine

MMR1 monthly vaccine coverage estimates measured at 18 months of age for from 2019 to 2021, show a monthly decrease from April 2020 onwards. In March 2021, 86.4% of infants were vaccinated with MMR1 at 18 months of age (Table 3 and Figure 7).

The August 2020 ImmForm coverage data reflects children first scheduled for MMR1 at 12 months of age from February 2020 onwards (pre-lockdown). The 2.1 percentage points

decrease in this cohort indicates that these children may have missed their initial scheduled vaccination appointment but were potentially unable to catch-up by 18 months of age as social distancing measures began. Children scheduled from 12 months of age for MMR1 from March 2020 onwards are reflected in September 2020 ImmForm coverage data onwards. 18 month MMR1 coverage between September and December 2020 was lower than coverage estimates between September and December 2019, indicating that infants scheduled for their MMR1 vaccine between March and June have most likely been impacted by COVID-19 restrictions. MMR1 coverage from January and February 2021 are 1.4 and 1.2 percentage points lower compared to the same months in 2019. Vaccine coverage was 0.8 and 1.8 percentage points lower in March 2021 compared to March 2019 and March 2020 (reflecting infants scheduled to receive this vaccine in September 2020) (Figure 7). The impact of COVID-19 on MMR1 coverage will continue to be monitored in the April 2021 extract which will reflect coverage in children that turned 12 months in October 2020.

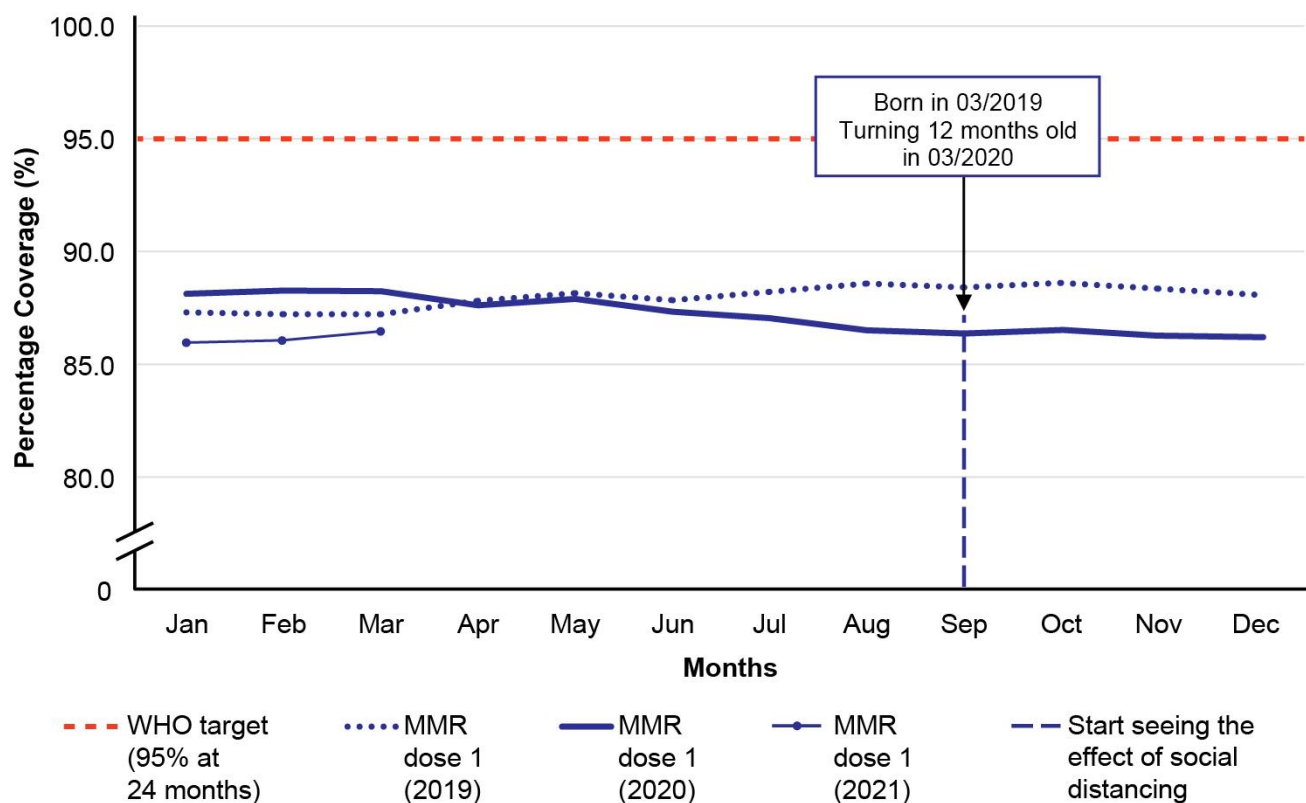
In 2019, 2020 and 2021, MMR1 coverage is substantially below the WHO target of 95% coverage at 24 months.

Table 3. Vaccine coverage for dose 1 of the MMR vaccine by survey month (extracted at 18-month age cohorts) in 2019, 2020 and 2021

	MMR dose 1 (%)				
Survey month	2019	2020	Percentage point difference 2020 compared to 2019	2021	Percentage point difference 2021 compared to 2019
January	87.3	88.1	0.8	85.9	-1.4*
February	87.2	88.3	1.0	86.0	-1.2*
March	87.2	88.2	1.0	86.4	-0.8*
April	87.8	87.6	-0.2		
May	88.2	87.9	-0.3		
June	87.8	87.3	-0.5		
July	88.2	87.1	-1.1		
August	88.6	86.5	-2.1		
September	88.4	86.4	-2.0*		
October	88.6	86.5	-2.1*		
November	88.4	86.3	-2.1*		
December	88.1	86.2	-1.9*		

* Indicates cohorts of infants scheduled to receive their vaccine from March 2020 onwards

Figure 7: Vaccine coverage for MMR1 at 18 months of age by survey month in 2019, 2020 and 2021



Discussion

This report presents an early indication of the impact of COVID-19 on routine childhood immunisations in England, using data from vaccine counts and early vaccine coverage data. The purpose of this report is to provide early coverage estimates to those who monitor and support the routine immunisation programme at both a local and national level, before the official 12 and 24 month estimates of vaccine coverage during the COVID-19 pandemic are analysed by the COVER programme.

Together the vaccine counts data and the vaccine coverage data both point towards a sustained decrease in children receiving routine childhood immunisations in 2020 compared to 2019. Since April 2020, fewer infants have completed the full course of 3 Hexavalent vaccines by 6 months of age, and fewer children have received MMR1 by 18 months of age. The initial decrease in vaccination may be associated with COVID-19 messaging about staying home initially, overwhelming the messaging that the routine immunisation programme was to remain operating as usual [4,13]. Additionally, anecdotal information indicated that in some areas, to ensure safe and best practice, GPs had to reschedule appointments in the initial weeks to ensure social distancing within GP practices. Overall, decreased vaccination coverage and lower counts compared to 2019 levels have continued throughout the pandemic.

Vaccine Counts

At the introduction of the physical distancing measures on 23 March 2020 (week 13), vaccination counts for MMR1 and dose 1 Hexavalent fell compared to 2019. Vaccination counts for both vaccines began to rise in weeks 16 and 17 and were comparable to 2019 counts, and to counts in 2020 prior to the COVID-19 pandemic, indicating that the initial drop had recovered. Vaccination counts have remained stable during the tiered restrictions and the second lockdown. Overall vaccination counts for dose 1 Hexavalent and MMR1 vaccines remain lower than the 2019 counts indicating fewer vaccines have been delivered throughout the pandemic. It should be noted that a drop in birth rates associated with the pandemic have been observed in December 2020 [14]. This decrease may be related to a number of factors associated with the pandemic including the introduction of social distancing and lockdown measures introduced from March 2020, when most of these women would have conceived. These infants born in December 2020 become eligible for their first dose of Hexavalent vaccine in February 2021, therefore, the drop in vaccine counts compared to 2019 may be a consequence of the lower birth rate observed.

Vaccine Coverage

Early assessment of age-specific vaccine coverage allows local areas to assess performance before children reach the age that formal vaccine coverage is evaluated, therefore giving local teams an opportunity to catch-up where shortfalls have been identified.

Vaccine coverage for all 3 doses of the Hexavalent vaccine in 2021 is broadly similar to vaccine coverage in 2019, the size of the decrease in vaccine coverage is increasingly smaller since January 2021 onwards.

Our early monthly assessment of MMR1 coverage measured at 18 months of age falls far short of the WHO target of 95% coverage by 24 months of age. 18 month coverage was 0.8 percentage points lower in March 2021 than in March 2019. Coverage will continue to be closely monitored for MMR1 in the upcoming months.

The data presented in the most recent COVER report largely reflects vaccines administered before and at the very beginning stages the COVID-19 pandemic started, children who missed some of their routine immunisations when first scheduled and otherwise might have caught up by the first, second or fifth birthday, may have been impacted by the lockdown and/or local restrictions from late March 2020 onwards. This data aligns with our findings in Hexavalent and MMR vaccine coverage at 6 and 18 months among children eligible prior to the pandemic.

Strengths and limitations

This interim analysis of early vaccine coverage for children before they reach the target ages of 12 and 24 months used for routine surveillance systems provides a timelier assessment of the impact of COVID-19 on primary immunisations in England. The report helps monitor national level vaccine coverage throughout the pandemic.

The vaccination counts data presented in this report was the first available data extracted to monitor the impact of COVID-19 on primary immunisations in England. Weekly vaccination counts do show an early assessment and may predict future drops in vaccine coverage extracted in later ImmForm extracts. However, it is important to note that the data is only from one GP IT supplier (TPP) and coverage estimates cannot be calculated without age-specific denominator data. Additionally, some regions are less represented than others and therefore do not represent data for all of England. This data should therefore be viewed with some caution and will not necessarily reflect vaccination count trends at a local level. The drop in vaccination counts may be explained by a slightly smaller cohort or a small decline in coverage [5].

Vaccine coverage estimates from ImmForm show early estimates of vaccine coverage. This data allows for local performance management where areas can assess which cohorts may require further follow-up for vaccination. Vaccine coverage estimates are extracted by GP IT suppliers, based on a set list of SNOMED CT codes, therefore these estimates only reflect coverage for children registered with a GP practice, and that have correct coding in their GP record. Furthermore, the ImmForm data is experimental data and to date has only been used for performance management purposes – it is not validated at the GP practice level. Smaller areas may see greater differences in coverage due to smaller numbers.

Conclusion

Future weekly vaccination counts data from TPP and monthly ImmForm collections will continue to monitor any impact of COVID-19 on early vaccine coverage. Vaccine coverage will vary across the country and local areas can monitor early estimates of coverage in their areas using ImmForm and other data sources to identify areas needing more support.

As physical distancing measures change throughout the course of the pandemic and the risk of other infectious diseases circulating increases it is of utmost importance that GPs continue offering routine immunisations, check and recall those who have not received a vaccine and, where required, recovery plans should be set in place to address any drop in vaccine coverage observed since the beginning of the pandemic.

Local areas should engage with specific cohorts of infants and children who may have been affected when social distancing measures were introduced, to ensure that they are rescheduled for their immunisations. These children will remain eligible and will be assessed in the appropriate age-specific routine quarterly coverage estimates in the COVER publication.

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Appendices

Table A1. Monthly data extracts from ImmForm survey for Hexavalent vaccine, showing month of birth and the month vaccine is first due

Hexavalent Vaccine					
Month data is extracted from ImmForm	Age at which data is extracted	Month of birth	Month vaccine first due		
			Dose 1 (8 weeks old)	Dose 2 (12 weeks old)	Dose 3 (16 weeks old)
Jan 2020	6 months	Jul 2019	Sep 2019	Oct 2019	Nov 2019
Feb 2020	6 months	Aug 2019	Oct 2019	Nov 2019	Dec 2019
Mar 2020	6 months	Sep 2019	Nov 2019	Dec 2019	Jan 2020
Apr 2020	6 months	Oct 2019	Dec 2019	Jan 2020	Feb 2020
May 2020	6 months	Nov 2019	Jan 2020	Feb 2020	Mar 2020
Jun 2020	6 months	Dec 2019	Feb 2020	Mar 2020	Apr 2020
Jul 2020	6 months	Jan 2020	Mar 2020	Apr 2020	May 2020
Aug 2020	6 months	Feb 2020	Apr 2020	May 2020	Jun 2020
Sep 2020	6 months	Mar 2020	May 2020	Jun 2020	Jul 2020
Oct 2020	6 months	Apr 2020	Jun 2020	Jul 2020	Aug 2020
Nov 2020	6 months	May 2020	Jul 2020	Aug 2020	Sep 2020
Dec 2020	6 months	Jun 2020	Aug 2020	Sep 2020	Oct 2020
Jan 2021	6 months	Jul 2020	Sep 2020	Oct 2020	Nov 2020
Feb 2021	6 months	Aug 2020	Oct 2020	Nov 2020	Dec 2020
Mar 2021	6 months	Sep 2020	Nov 2020	Dec 2020	Jan 2021

Table A2. Monthly data extracts from ImmForm survey for MMR1 vaccine, showing month of birth and the month vaccine is first due

MMR1			
Month data is extracted from ImmForm	Age at which data is extracted	Month of birth	Month vaccine first due
Jan 2020	18 months	Jul 2018	Jul 2019
Feb 2020	18 months	Aug 2018	Aug 2019
Mar 2020	18 months	Sep 2018	Sep 2019
Apr 2020	18 months	Oct 2018	Oct 2019
May 2020	18 months	Nov 2018	Nov 2019
Jun 2020	18 months	Dec 2018	Dec 2019
Jul 2020	18 months	Jan 2019	Jan 2020
Aug 2020	18 months	Feb 2019	Feb 2020
Sep 2020	18 months	Mar 2019	Mar 2020
Oct 2020	18 months	Apr 2019	Apr 2020
Nov 2020	18 months	May 2019	May 2020
Dec 2020	18 months	Jun 2019	Jun 2020
Jan 2021	18 months	Jul 2019	Jul 2020
Feb 2021	18 months	Aug 2019	Aug 2020
Mar 2021	18 months	Sep 2019	Sep 2020

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