



## Falling Vaccination Rates: The Case of the MMR Jab

### Summary

In recent years vaccination rates have declined both domestically and internationally. The World Health Organisation has listed vaccine hesitancy as one of its ten threats to global health.

This briefing focuses on falling rates for the measles, mumps and rubella (MMR) vaccine. Cases of measles worldwide have increased in recent years. Four out of the six world regions experienced a significant measles outbreak in 2018, while the UK recently lost its measles-free status.

Misinformation about the risks of vaccination remain a major factor in declining MMR vaccination rates. The Health Secretary, Matt Hancock, has previously criticised social media companies over the spread of misinformation on their platforms. Some social media companies, including Facebook, have announced plans to tackle the spread of vaccine misinformation. Other reasons found for vaccine hesitancy include difficulty accessing vaccination services, a complacency about the risks of measles and the perceived cost of vaccinations.

In August 2019, the Prime Minister, Boris Johnson, announced a series of measures to increase vaccination rates. These included urging GPs to write to patients promoting catch-up MMR vaccination programmes and the strengthening of local immunisation coordinators. The Conservative Party manifesto for the 2019 general election also promised a national vaccination strategy to tackle declining MMR rates.

Philip Lewis | 28 January 2020

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## I. Introduction

In recent years vaccination rates have declined both domestically and internationally. In England, rates for children up to the age of five, across all routine vaccinations, decreased by between 0.2% and 1% in the year up to March 2019.<sup>1</sup> In addition, the World Health Organisation (WHO) has stated that in 2017 only seven countries globally have reported no evidence of either vaccine hesitancy, a delay in acceptance, or refusal of vaccines. As a result, the WHO has listed vaccine hesitancy as one of its 'ten threats to global health'. Both the WHO and the UK Government have raised specific concerns about declining MMR rates.

This briefing focuses on falling vaccination rates for measles. Measles is a highly infectious viral illness with symptoms including fever and a distinctive red/brown rash. Complications from measles can include diarrhoea, pneumonia and, in rare cases, encephalitis (inflammation of the brain).<sup>2</sup>

## 2. Measles and the MMR Vaccine

A combined live measles, mumps and rubella (MMR) vaccine holds advantages over individual vaccines.<sup>3</sup> Two doses of the MMR vaccine are offered across the UK. The first dose is offered to all children usually within a month of their first birthday.<sup>4</sup> The second dose is then offered between three years and four months and five years of age, ensuring that children should receive both doses before (or very shortly after) starting school.<sup>5</sup> While some children may fail to receive the first dose before their second birthday, they can safely receive it at a later stage before their fifth birthday.

According to WHO guidance, vaccination coverage of at least 95% is required to successfully prevent outbreaks and achieve population ('herd') immunity.<sup>6</sup>

Despite the availability of the MMR vaccine, cases of measles worldwide have increased in recent years.<sup>7</sup> Four out of the six world regions experienced a significant measles outbreak in 2018.<sup>8</sup> In its 2018 report on the global vaccine action plan, the WHO acknowledged that progress had been too slow to meet its target of eliminating measles by 2020.<sup>9</sup>

The UK recently lost its measles-free status with the WHO after 231 cases were confirmed in the first quarter of 2019.<sup>10</sup> This increased to 301 new measles infections in the second quarter of the year. The *British Medical Journal* (BMJ) has highlighted the risk of measles becoming endemic in the UK.<sup>11</sup>

<sup>1</sup> NHS Digital, '[Childhood Vaccination Coverage Statistics: England 2018–19](#)', accessed 12 November 2019.

<sup>2</sup> NHS, '[Overview: Measles](#)', accessed 22 November 2019.

<sup>3</sup> World Health Organisation, '[Measles, Mumps and Rubella \(MMR\)](#)', accessed 17 January 2020.

<sup>4</sup> NHS, '[MMR Vaccine Overview](#)', accessed 14 January 2020.

<sup>5</sup> *ibid.*

<sup>6</sup> World Health Organisation, '[Infographic: Herd Immunity: Fighting Measles is a Shared Responsibility](#)', accessed 14 January 2020.

<sup>7</sup> *Lancet Child and Adolescent Health*, '[Vaccine Hesitancy: A Generation at Risk](#)', 1 May 2019, vol 3 no 5, p 281.

<sup>8</sup> World Health Organisation, '[2018 Assessment Report of the Global Vaccine Action Plan](#)', 2018.

<sup>9</sup> *ibid.*, p 4.

<sup>10</sup> Public Health England, '[MMR Vaccination Call Following High Numbers of Cases](#)', accessed 17 December 2019.

<sup>11</sup> Fiona Godlee, '[What Should We Do About Vaccine Hesitancy?](#)', *British Medical Journal*, 6 June 2019, issue 8202.

### 3. What are the Current MMR Vaccination Rates in England?

In 2018/19, 90.3% of children in England completed the first dose of the MMR vaccine (MMR1) before the age of 24 months.<sup>12</sup> On a regional level, coverage at 24 months was highest in the North East, and lowest in London. No region exceeded the WHO target of 95%.

**Table 1: Percentage of MMR1 Vaccine Coverage at 24 Months by Region<sup>13</sup>**

	2017/18	2018/19
<b>England</b>	91.2	90.3
<b>North East</b>	94.5	94.5
<b>North West</b>	92.9	92.4
<b>Yorkshire &amp; Humber</b>	93.3	92.8
<b>East Midlands</b>	93.1	92.0
<b>West Midlands</b>	91.2	90.6
<b>East of England</b>	92.4	91.3
<b>London</b>	85.1	83.0
<b>South East</b>	91.5	91.4
<b>South West</b>	93.3	93.0

Coverage was higher at a national level for MMR1 for children at the age of five years. This measure did previously exceed the WHO's 95% target in 2016/17. However, the figure decreased in the subsequent two years, reaching 94.5% in 2018/19. Currently, seven out of nine English regions exceed the 95% target.

**Table 2: Percentage of MMR1 Vaccine at Five Years by Region<sup>14</sup>**

	2017/18	2018/19
<b>England</b>	94.9	94.5
<b>North East</b>	97.2	96.6
<b>North West</b>	95.9	95.3
<b>Yorkshire &amp; Humber</b>	95.9	95.8
<b>East Midlands</b>	96.4	95.9
<b>West Midlands</b>	95.7	95.3
<b>East of England</b>	96.1	95.5
<b>London</b>	91.4	90.4
<b>South East</b>	93.9	94.1
<b>South West</b>	96.1	96.0

<sup>12</sup> NHS Digital measure all vaccinations at twelve months, 24 months and five years (NHS Digital, '[Fall in Coverage for all Routine Childhood Vaccinations in England in 2018–19](#)', 26 September 2019).

<sup>13</sup> NHS Digital and Public Health England, '[Childhood Vaccination Coverage Statistics England 2018–19](#)', accessed 22 November 2019, p 16.

<sup>14</sup> *ibid*, p 18.

Coverage across England in 2018/19 for the second dose of the MMR vaccine (MMR2) at five years was 86.4%. As with MMRI, the North East had the highest coverage, and London the lowest. No region achieved the WHO's 95% target.

**Table 3: Percentage of MMR2 Vaccine at Five Years by Region<sup>15</sup>**

	2017/18	2018/19
<b>England</b>	87.2	86.4
<b>North East</b>	91.9	91.4
<b>North West</b>	89.4	88.9
<b>Yorkshire &amp; Humber</b>	90.5	89.9
<b>East Midlands</b>	89.0	88.5
<b>West Midlands</b>	87.6	86.7
<b>East of England</b>	89.8	88.1
<b>London</b>	77.8	76.3
<b>South East</b>	87.2	87.4
<b>South West</b>	90.9	90.7

All three of the tables above generally demonstrated a decreasing rate of MMR coverage from 2017/18.

Coverage rates in Scotland, Wales and Northern Ireland are higher than those in England.<sup>16</sup> In Scotland, coverage of MMR1 at 24 months was 93.8% in the quarter leading up to September 2019,<sup>17</sup> compared to 90.1% coverage in England for the same period.<sup>18</sup> In Northern Ireland, the figure was 92.4%.<sup>19</sup>

#### **4. What are the Reasons for Declining MMR Rates?**

The reasons for declining vaccination rates and increasing vaccine hesitancy are complex and wide-ranging. Concern and misinformation about the risks of vaccination remain a major factor in vaccine hesitancy.<sup>20</sup>

##### **4.1 Wakefield Study and Its Legacy**

In February 1998, the *Lancet* medical journal published an article that linked the combined MMR vaccine to the development of autism spectrum disorders in children, along with certain bowel

<sup>15</sup> NHS Digital and Public Health England, '[Childhood Vaccination Coverage Statistics England 2018–19](#)', accessed 22 November 2019, p 19.

<sup>16</sup> *ibid*, p 27.

<sup>17</sup> ISD Scotland, '[Childhood Immunisation Statistics Scotland—Quarter Ending 30 September 2019](#)', 10 December 2019.

<sup>18</sup> Public Health England, '[Quarterly Vaccination Coverage Statistics for Children Aged up to Five Years in the UK \(COVER Programme\): July to September 2019](#)', 13 December 2019.

<sup>19</sup> Public Health Agency, '[Vaccination Coverage Statistics for Children in Northern Ireland](#)', accessed 14 January 2020.

<sup>20</sup> World Health Organisation, '[2018 Assessment Report of the Global Vaccine Action Plan](#)', 2018, p 9.

disorders.<sup>21</sup>

This link was later disproved. The Institute of Medicine (now the National Academy of Medicine) published a report in 2004 that found there was no causal relationship between the MMR vaccine and autism.<sup>22</sup> The original article was formally retracted by the *Lancet* in 2010.<sup>23</sup> Also in 2010, the lead author of the study, gastroenterologist Dr Andrew Wakefield, was found guilty by the General Medical Council of dishonesty and of flouting ethics protocols for his role in conducting the study, and was struck off the medical register.<sup>24</sup>

NHS Digital and Public Health England have acknowledged that a significant drop in MMR uptake in England during the late-1990s and mid-2000s was linked to the Wakefield study (coverage rates of MMR I at 24 months fell to 79.9% in 2003/04).<sup>25</sup>

## 4.2 Social Media and Misinformation

Research from the WHO on the topic of vaccine hesitancy has shown that awareness of vaccinations has increased. However, the research suggested that concerns about perceived risk of vaccinations has also increased.<sup>26</sup>

In its latest *Assessment Report of the Global Vaccine Action Plan*, the WHO stated:

Social media accounts have been used to provoke debate about immunisation safety to undermine trust in national authorities.<sup>27</sup>

Some sources have claimed that vaccine hesitant parents tend to be more active in searching for information online than vaccine compliant parents.<sup>28</sup>

The Health Secretary, Matt Hancock, has previously criticised social media companies over the spread of misinformation on their platforms.<sup>29</sup> Some social media companies have recently begun to act to tackle vaccine misinformation.

In March 2019, Facebook announced a series of measures, including:

- reducing the ranking of groups and pages that spread misinformation about vaccinations in news feed and search; and

<sup>21</sup> *Lancet*, '[Retraction—Ileal-Lymphoid-Nodular Hyperplasia, Non-specific Colitis, and Pervasive Developmental Disorder in Children](#)', 6 February 2010, vol 375 no 9713, p 445.

<sup>22</sup> Institute of Medicine (US) Immunization Safety Review Committee, *Immunization Safety Review: Vaccines and Autism*, 2004.

<sup>23</sup> *Lancet*, '[Retraction—Ileal-Lymphoid-Nodular Hyperplasia, Non-Specific Colitis, and Pervasive Developmental Disorder in Children](#)', 6 February 2010, vol 375 no 9713, p 445.

<sup>24</sup> Sarah Boseley, '[Andrew Wakefield Struck Off Register by General Medical Council](#)', *Guardian*, 24 May 2010.

<sup>25</sup> NHS Digital and Public Health England, '[Childhood Vaccination Coverage Statistics England 2018–19](#)', accessed 22 November 2019, p 15.

<sup>26</sup> World Health Organisation, *2018 Assessment Report of the Global Vaccine Action Plan*, accessed 22 November 2019, p 9.

<sup>27</sup> *ibid*, p 9.

<sup>28</sup> *Lancet Child and Adolescent Health*, '[Vaccine Hesitancy: A Generation at Risk](#)', May 2019, vol 3 no 5, p 281.

<sup>29</sup> Peter Walker, '[Hancock: Compulsory Vaccinations Being Seriously Considered](#)', *Guardian*, 29 September 2019.

- rejecting adverts that include promotion of misinformation.<sup>30</sup>

Facebook has also said that it may remove access to fundraising tools for pages that spread misinformation. In addition, in September 2019, Facebook announced that it would ensure that “educational units” about vaccines from organisations such as the WHO would appear alongside vaccine-related searches and content.<sup>31</sup>

However, there is some disagreement about the extent of social media’s influence in spreading vaccine hesitancy. In a study carried out by Public Health England, only 9% of a sample of parents had seen information that increased vaccine hesitancy, down from a third of parents in similar research from 2002.<sup>32</sup> In addition, the study found that only 14% of these parents mentioned social media specifically as their main source of information.<sup>33</sup>

### 4.3 Other Reasons for Vaccine Hesitancy

There are also said to be other reasons, aside from misinformation, for declining MMR vaccination rates. For example, parents who may not hold anti-vaccination beliefs may face other barriers to accessing vaccinations, including their relationships/engagement with specific health professionals and a complacency about the risk of measles.<sup>34</sup> This may be particularly true in developing countries. Other reasons that have been reported include:<sup>35</sup>

- difficulty accessing vaccination services;
- perceived costs of vaccinations; and
- specific cultural or religious barriers.

A 2017 systematic review of parents’ and caregivers’ views and experiences regarding communication about childhood vaccinations found that, in general, parents wanted more information about vaccinations than they were getting and sometimes struggled to know whether the information they received was balanced and trustworthy. The review also found that a good relationship with a trusted health professional led to increased trust in that vaccination information.<sup>36</sup>

## 5. What is the UK Government Doing?

This section focuses on policy applying to England. Policy in this area is a devolved matter in Scotland, Wales and Northern Ireland.<sup>37</sup>

In August 2019, the Prime Minister, Boris Johnson, announced a series of measures to increase

<sup>30</sup> Facebook, ‘[Combatting Vaccine Misinformation](#)’, 7 March 2019.

<sup>31</sup> Dr Sejal Parekh ‘[Facebook Alters Policies to Combat Vaccine Misinformation](#)’, ABC News, 4 September 2019.

<sup>32</sup> Public Health England, ‘[PHE Offers Support to UK Vaccine Heroes](#)’, 24 April 2019.

<sup>33</sup> *ibid.*

<sup>34</sup> Public Health Wales, ‘[To Vaccinate or Not? Factors and Solutions Influencing Hesitancy](#)’, accessed 27 November 2019.

<sup>35</sup> *ibid.*, p 6.

<sup>36</sup> HM Ames et al, ‘[Parents’ and Informal Caregivers’ Views and Experiences of Communication About Routine Childhood Vaccination: A Synthesis of Qualitative Evidence](#)’, *Cochrane Database of Systematic Reviews*, 7 February 2017.

<sup>37</sup> Civil Service, ‘[Devolution: Factsheet](#)’, accessed 25 November 2019.

vaccination rates. These included:

- NHS England writing to GPs to urge them to promote catch-up MMR vaccination programmes;
- strengthening the role of local immunisation coordinators in hard-to-reach communities; and
- calling a summit of social media companies to discuss how they can promote accurate information about vaccinations.<sup>38</sup>

A “comprehensive strategy” on raising vaccination rates was also announced, due to be published in autumn 2019. This strategy has not yet been published.

The Secretary of State for Health, Matt Hancock, has previously said there is a “very strong argument” for compulsory vaccine programmes.<sup>39</sup> However, the Government has since denied that there are any plans to enforce vaccinations, emphasising that its priority is making it easier for parents to get their children vaccinated.<sup>40</sup>

Opinion in the UK is divided over the efficacy of compulsory vaccination. Some studies have suggested that current vaccination policies are not sufficient to achieve and maintain measles elimination.<sup>41</sup> However, others have questioned the evidence behind compulsory vaccinations, instead arguing that improving the infrastructure behind the delivery of vaccinations should be the priority.<sup>42</sup> Other European states, such as Italy, have introduced fines for parents who send their child to school without having received their vaccinations.<sup>43</sup>

## 5.1 General Election 2019 and Further Commentary

Following the announcement of the 2019 general election, the Conservatives and Labour addressed the issue of declining vaccination rates in their manifestos.

The Conservative Party stated that it would continue to promote the uptake of vaccines through a “national vaccination strategy”.<sup>44</sup> On 27 November 2019, the Secretary of State for Health, Matt Hancock, expanded on this policy, stating: “We will introduce a national vaccination reminder system, to make sure as many children as possible are vaccinated”.<sup>45</sup>

In its manifesto, the Labour Party called the re-emergence of measles “an indictment”. It stated that the party would “urgently put in place a vaccination action plan to regain our measles-free status in

<sup>38</sup> Department of Health and Social Care and Prime Minister’s Office, [‘Prime Minister Order Urgent Action to Improve Vaccination Uptake’](#), 18 August 2019.

<sup>39</sup> Peter Walker, [‘Hancock: Compulsory Vaccinations Being Seriously Considered’](#), *Guardian*, 29 September 2019.

<sup>40</sup> Peter Walker, [‘No Plan to Require Vaccinations at State Schools, Says No 10’](#), *Guardian*, 30 September 2019.

<sup>41</sup> Filippo Trentini et al, [‘The Introduction of ‘No Jab, No School’ Policy and the Refinement of Measles Immunisation Strategies in High-income Countries’](#), *BMC Medicine*, 17 May 2019.

<sup>42</sup> Eleanor Draeger, [‘Should Measles Vaccination be Compulsory?’](#), *British Medical Journal*, 5 June 2019, issue 8202.

<sup>43</sup> BBC News, [‘Italy Bans Unvaccinated Children from School’](#), 12 March 2019.

<sup>44</sup> Conservative Party, [‘Conservative Party Manifesto 2019’](#), November 2019, p 11.

<sup>45</sup> Kate Proctor, [‘Tories Plan Vaccination Text Reminders from GPs to Boost Uptake’](#), *Guardian*, 27 November 2019.

WHO listings”.<sup>46</sup>

In a 2019 guest blog for health thinktank the Nuffield Trust, the paediatrician and academic Dr Rakhee Shah acknowledged that traditional policies to tackle vaccine misinformation are still important. These include training health professionals in effective communication and involving local communities, parent groups and religious leaders to advocate for immunisation. However, Dr Shah said that the digital nature of the problem requires new and innovative policy solutions. These include:

- real-time monitoring of data allowing earlier intervention;
- recruiting a diverse range of citizens to vaccine advisory boards to break online echo chambers; and
- the creation of a national media literacy plan to improve individual fact-checking skills.<sup>47</sup>

## 6. What are Other Countries Doing?

Internationally, a variety of measures have been implemented to try to improve vaccination rates.

Researchers in Italy have argued that compulsory vaccination programmes may be the most effective solution to declining rates.<sup>48</sup> Following a measles outbreak in January 2017, the country legislated to extend the number of mandatory vaccines from four to ten. This included the MMR vaccination.<sup>49</sup> France has taken a similar approach, expanding the number of mandatory vaccinations from three to eleven for children born after 1 January 2018. In addition, unvaccinated children will not be able to enrol at nurseries or schools.<sup>50</sup> Vaccination rates in both countries increased after the introduction of these laws.<sup>51</sup>

However, there has been criticism of compulsory vaccination policies. The Italian Parliament continues to debate whether a more flexible approach is more appropriate. Other countries have taken a sanctions-based approach, while staying clear of making vaccinations fully mandatory. In 2016, Australia introduced a ‘No Job, No Pay’ policy, which withholds certain welfare benefits to parents of children who have not received key vaccinations and do not have a medical exemption.<sup>52</sup> Research has shown that parents are broadly supportive of this policy, but raised concerns about it having a disproportionate effect on poorer communities.<sup>53</sup>

<sup>46</sup> Labour Party, [Labour Party Manifesto 2019](#), November 2019, p 34.

<sup>47</sup> Dr Rakhee Shah, [‘Fake News: A Threat to Curbing Vaccine-preventable Diseases in the UK’](#), Nuffield Trust, 28 January 2019.

<sup>48</sup> BBC News, [‘Measles: Experts Call for Compulsory Vaccination’](#), 17 May 2019.

<sup>49</sup> Fortunato D’Ancona et al, [‘The Law on Compulsory Vaccination in Italy: An Update 2 Years After the Introduction’](#), *Eurosurveillance*, 27 June 2019, vol 24 no 26.

<sup>50</sup> Daniel Lévy-Bruhl et al, [‘Extension of French Vaccination Mandates: From the Recommendation of the Steering Committee of the Citizen Consultation on Vaccination to the Law’](#), *Eurosurveillance*, 26 April 2018, vol 23 no 17.

<sup>51</sup> Matthew Warren, [‘Vaccination Rates Rise in Italy and France after Law Change’](#), *Nature*, 16 July 2016.

<sup>52</sup> Australian Department of Health, [‘No Job, No Pay—New Immunisation Requirements for Family Assistance Payments’](#), accessed 26 November 2019.

<sup>53</sup> Mallory J Trent et al, [‘Parental Opinions Towards the “No Job, No Pay” Policy in Australia’](#), *Vaccine*, 23 August 2019, vol 36 no 36, pp 5250–6.

## 7. Further Information

- Meredith Wadman, *The Vaccine Race*, 2018
- Royal Society for Public Health, [Moving the Needle: Promoting Vaccination Uptake Across the Life Course](#), January 2019
- National Audit Office, [Investigation into Pre-school Vaccinations](#), 25 October 2019, HC 100 of session 2019–20
- World Health Organisation, [The Global Vaccine Action Plan 2011–2020: Review and Lessons Learned](#), January 2020