BMJ 2019;365:l2359 doi: 10.1136/bmj.l2359 (Published 5 June 2019)

HEAD TO HEAD

HEAD TO HEAD

Should measles vaccination be compulsory?

Making MMR vaccination mandatory would still allow parents to choose not to vaccinate their children while protecting those attending schools or nurseries, says **Eleanor Draeger**. But **Helen Bedford** and **David Elliman** worry that such a step might lead to unintended consequences and recommend exploring potential obstacles to vaccine uptake first

Eleanor Draeger *sexual health doctor and medical writer*[1], Helen E Bedford *professor of children's health*[2], David A C Elliman *consultant paediatrician*[3]

[1]Gravesend; [2]UCL Great Ormond Street Institute of Child Health, London; [3]Great Ormond Street Hospital, London

Yes—Eleanor Draeger

Unicef published a sobering report on vaccination in 2018,[1] and in April 2019 it showed that an estimated 169 million children had missed out on a first dose of the measles vaccine from 2010 to 2017—21.1 million children a year on average, which includes more than 500 000 children in the UK alone.[1 2]

The latest report on uptake of the measles, mumps, and rubella (MMR) vaccine in the UK is 94.9% for the first dose, but this drops to 87.2% for the second dose,[3] which falls short of the 95% needed to produce herd immunity. If vaccination rates continue to decline we run the risk of measles becoming endemic again.

Above and beyond free access to government recommended vaccines, which we already have in the UK, there are many ways to increase vaccination rates. These broadly fit into three categories: education (including communication and public engagement), incentives, and legislation.[4] Education is the most widely practised, but legitimate online sources on vaccination must compete with fake news and "antivax" rhetoric. An online study in 2010 found that viewing a website criticising vaccines for five to 10 minutes increased people's perception of risk from vaccinations and decreased the intention to vaccinate.[5]

Punitive policies

In Europe, vaccination is compulsory for at least one childhood disease in 11 countries, nine of which include measles. Italy increased its number of compulsory vaccinations from four to 10 in July 2017, measles being among the additional vaccines.[6] If children remain unvaccinated when attending primary school their parents are fined. In January 2018 Italy's ministry of health reported that 29.8% of unvaccinated children born from 2011 to 2015 had been vaccinated since the new law was enforced.[7]

Australia doesn't have compulsory vaccination as such, instead using financial incentives and quasi-mandatory vaccination. Its national policy of "no jab, no pay" stops parents from receiving some financial benefits unless their children are up to date with their immunisations or have a valid medical exemption certificate. Four states have an additional "no jab, no play" policy, where children can't be enrolled at school or nursery without proof that they're up to date or medically exempt. These policies have increased uptake: more than 5000 previously unvaccinated children received vaccines in the six months after the new law was passed in 2015.[4]

In UK society, many things are legislated for to improve individual or public health. Examples include the Children and Young Persons (Protection from Tobacco) Act 1991, which prohibits the sale of tobacco to anyone under 18, and the Smoke-free (Premises and Enforcement) Regulations 2006, which prohibit smoking in enclosed public places, preventing non-smokers from being affected by passive smoking in those areas.

I would argue that the UK now needs to legislate to increase vaccination rates, as current measures aren't keeping rates high enough to ensure herd immunity. A recent article by Trentini and colleagues simulated the effect of current vaccine strategies on future susceptibility to measles, concluding that the UK may need to introduce compulsory vaccination to bring susceptibility low enough to eliminate measles.[8]

Vaccination has previously been compulsory in the UK: the Vaccination Act 1853 was passed to increase smallpox immunisation. This led directly to the formation of the Anti-Vaccination League, which organised protests around the UK and eventually got the law changed to allow conscientious objection. The arguments of vaccine sceptics today are very similar to those used in the 1800s, and many parents wrongly

Correspondence to: E Draeger elsdraeger@hotmail.com, David A C Elliman david.elliman@nhs.net Follow Eleanor Draeger on Twitter: @elsdraeger

believe the rhetoric that vaccines are harmful, unnatural, and an infringement of civil liberties.

Protecting the vulnerable

Ethicists have argued, however, that compulsory vaccination is acceptable because people who don't vaccinate their children are potentially putting other people's health at risk—particularly those who can't be vaccinated for reasons of age or immunosuppression and are therefore more vulnerable. Brennan argues that "one can justify mandatory, coercively enforced vaccinations, not on paternalistic grounds, but instead on the grounds that individuals may be stopped from participating in the collective imposition of unjust risk of harm."[9]

Passing a law that stops children attending nursery or school unless their vaccinations are up to date or they are medically exempt would allow philosophical objection, in that parents who disagreed with vaccination could decline vaccines for their children without posing a risk to any schoolchildren who can't be vaccinated for medical reasons. This would allow free choice while protecting vulnerable children.

No—Helen Bedford, David Elliman

Despite the highest ever rates of measles immunisation in Europe, 2018 saw the largest number of cases this decade (82 596), with 72 deaths.[10] This included 966 cases in England,[11] the most for five years.[12]

An inexpensive, highly effective vaccine with an excellent safety record is available,[13] but measles is once again a global problem. As unimmunised children pose a risk not only to themselves but to others who can't be vaccinated, it's unsurprising that mandatory vaccination has reappeared on the agenda, with senior members of the health service considering its introduction. Before embarking on this, however, we should consider the reasons for this resurgence of measles and review the evidence for possible interventions.

In the UK the uptake of a single dose of MMR vaccine at age 2 has fallen gradually, from a peak of 92.7% in 2013-14 to 91.2% in 2017-18.[3] At age 5, uptake of one dose is nudging 95% and is 87.2% for two doses. But these overall figures hide a wide variation around the country that explains why outbreaks are localised.

Infrastructure challenges

The reasons for non-vaccination vary between and within countries. Vaccine resistance has been suggested as a major factor for this and is important in some countries, but how important is it in the UK? In high income countries the proportion of parents refusing all vaccines is around 1-2%.[14] An important minority of parents may have concerns, but these can usually be dealt with effectively in discussion with informed healthcare professionals, in whom the overwhelming majority of the public still have considerable trust. Challenges to accessing services are more important.

So, before considering mandatory vaccination, we should rectify some of the infrastructure problems.[15] Does each general practice have a lead for immunisation? Do we have adequate call-recall systems in place? Are immunisation settings child and family friendly? Are session times appropriate for young families, or do they coincide with siblings being collected from school or nursery? Is opportunistic immunisation offered in other settings attended by children, such as hospital outpatient departments and nurseries (especially important for children with overdue vaccinations)? Do staff have adequate time to talk to parents, and have they been trained to tackle the limited number of issues that arise?

Uncertain consequences

Only when these components are in place should we consider mandatory vaccination. Even then, would it be appropriate for the UK, or could it have unintended consequences?[15] Evidence that mandatory vaccination has been effective in other countries is not conclusive, and no evidence exists in relation to the UK. Would parents still trust the NHS and healthcare professionals if GP data were used to decide whether a child was admitted to school or whether a family was allowed certain welfare benefits? We believe that mandatory vaccination could prejudice this.

Just as importantly, would it work? If school entry were denied, some parents who were determinedly opposed to vaccination may resort to home schooling, or groups of like minded parents may set up unregulated, informal childcare groups. Is it right to compromise children's life chances—which are so dependent on education—because of their parents' beliefs? If vaccination were attached to welfare benefits it would be the less well off, but determined, parents who would suffer disproportionately. Some parents who were undecided may become more resistant, not wishing to be told by the state how to bring up their children.

We were pleased to see that a recent House of Lords debate favoured improving services rather than compulsion[16]; and, unlike Trentini and colleagues,[9] we believe that the UK should concentrate on improving its infrastructure and not risk alienating parents unnecessarily.

Competing interests: ED's son caught measles when he was too young to have had the vaccine himself. (See BMJ Opinion, May 2019: https://blogs.bmj.com/bmj/2019/05/17/eleanor-draeger-we-have-reached-the-point-where-we-should-consider-compulsory-vaccination/)

Competing interests: DE has acted as an expert witness or provided reports for a number of legal cases involving vaccination. HB has no competing interests.

Provenance and peer review: Commissioned; not externally peer reviewed.

1 Unicef. *Immunization.* Unicef data. Jul 2018. https://data.unicef.org/topic/child-health/immunization/.
2 Unicef. Over 20 million children worldwide missed out on measles vaccine annually in past 8 years, creating a pathway to current global outbreaks—Unicef. 24 Apr 2019. https://www.unicef.org/press-releases/over-20-million-children-worldwide-missed-out-measles-vaccine-annually-past-8-years.
3 NHS Digital. Childhood vaccination coverage statistics—England 2017-18. 18 Sep 2018. https://digital.nhs.uk/data-and-information/publications/statistical/nhs-immunisation-statistics/england-2017-18.
4 Yang YT, Studdert DM. Linking immunization status and eligibility for welfare and benefits payments: the Australian "no jab, no pay" legislation. *JAMA* 2017;317:803-4. 10.1001/jama.2017.0123. 28245331
5 Betsch C, Renkewitz F, Betsch T, Ulshöfer C. The influence of vaccine-critical websites on perceiving vaccination risks. *J Health Psychol* 2010;15:446-55. 10.1177/1359105309353647 20348365
6 Bozzola E, Spina G, Russo R, Bozzola M, Corsello G, Villani A. Mandatory vaccinations in European countries, undocumented information, false news and the impact on vaccination uptake: the position of the Italian pediatric society. *Ital J Pediatr* 2018;44:67. 10.1186/s13052-018-0504-y 29898770
7 Signorelli C, Iannazzo S, Odone A. The imperative of vaccination put into practice. *Lancet Infect Dis* 2018;18:26-7. 10.1016/S1473-3099(17)30696-5 29303734
8 Trentini F, Poletti P, Melegaro A, Merler S. The introduction of 'No jab, No school' policy and the refinement of measles immunisation strategies in high-income countries. *BMC Med* 2019;17:86. 10.1186/s12916-019-1318-5 31096986
9 Brennan J. A libertarian case for mandatory vaccination. *J Med Ethics* 2018;44:37-43. 10.1136/medethics-2016-103486 27402886
10 World Health Organization. Measles in Europe: record number of both sick and immunized. 7 Feb 2017. http://www.euro.who.int/en/media-centre/sections/press-releases/2019/measles-in-europe-record-number-of-both-sick-and-immunized.
11 Public Health England. Laboratory-confirmed cases of measles, rubella and mumps, England: October to December 2018. 28 Feb 2019. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791349/hpr0819_mmr.pdf.
12 Public Health England, HSC Public Health Agency, Health Protection Scotland, Public Health Wales. UK measles and rubella immunisation strategy 2019. 9 Jan 2019. https://www.gov.uk/government/publications/measles-and-rubella-elimination-uk-strategy.
13 World Health Organization. Measles vaccines: WHO position paper–April 2017. *Wkly Epidemiol Rec* 2017;92:205-27.28459148

14 Brewer NT, Chapman GB, Rothman AJ, Leask J, Kempe A. Increasing vaccination: putting psychological science into action. *Psychol Sci Public Interest* 2017;18:149-207. 10.1177/1529100618760521 29611455

15 MacDonald NE, Harmon S, Dube E, etal . Mandatory infant & childhood immunization: Rationales, issues and knowledge gaps. *Vaccine* 2018;36:5811-8. 10.1016/j.vaccine.2018.08.042 30143274

16 House of Lords Hansard. Vaccinations and health screening services. 14 May 2019. https://hansard.parliament.uk/HoL%20Debate/2019-05-14/debates/4BC1ADBD-A973-43A8-B62B-F45CDDE79C40/web.