Evolution of the routine childhood meningococcal immunisation schedule in the UK and Ireland and its impact on clinical burden of invasive meningococcal disease

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BACKGROUND

- Invasive meningococcal disease (IMD) is the leading infectious cause of death in early childhood in the UK and Ireland[1,2]
- IMD is a notifiable disease in the UK and Ireland and control is a priority for clinical management and public health, and vaccination is the mainstay of IMD prevention[3–6]
- Disease monitoring and surveillance have guided the evolution of meningococcal vaccination schedules in the UK and Ireland in response to the changing epidemiology and to protect those most at risk[5,6]
- The current meningococcal vaccination schedule for the UK and Ireland can be seen in Table 1

OBJECTIVES & METHODS

- We reviewed publicly available national health surveillance data for the UK and Ireland to understand the evolution of the routine childhood meningococcal immunisation schedules and evaluate their impact on IMD

Table 1. The current UK and Ireland routine meningococcal immunisation schedule (October 2021)[5,6]

	UK	Ireland
Age	**Meningococcal Serogroup(s) Targeted by Vaccination**	
2 months	MenB	MenB
4 months	MenB	MenB
6 months		MenC
12–13 months	MenB MenC (Hib/MenC)†	MenB MenC (Hib/MenC)†
13–14 years*	MenACWY	MenACWY

*England and Wales, school Year 9; Northern Ireland, school Year 11; Scotland, school Year S3; Ireland, 1st year of secondary school
†Manufacture of the Hib/MenC vaccine has been discontinued with supply expected to continue until 2024/2025

RESULTS

The evolution of the routine meningococcal vaccine schedule in the UK and Ireland from 1999 to 2018 aligned with the change in the percentage of total confirmed cases of IMD (all ages) by serogroup during this period is shown in Figure 1.

Meningococcal C (MenC) vaccination

- In the mid-to-late 1990s, the incidence of MenC-IMD increased, and from 1999 a MenC vaccine was added to the routine infant immunisation programmes in the UK and Ireland[5,6]
- High vaccine uptake led to >90% reductions in the number of MenC-IMD cases within 5 years[5–7]
- Since then, infant schedules have evolved to provide optimum protection for children[5,6,8]
- From 2013, an adolescent booster MenC dose was added to the schedule, providing herd protection by reducing nasopharyngeal carriage[5,6]
- The number of MenC-IMD cases remains low, but there has been a slight rise over the last few years[5,6]

Meningococcal A, C, W, Y (MenACWY) vaccination

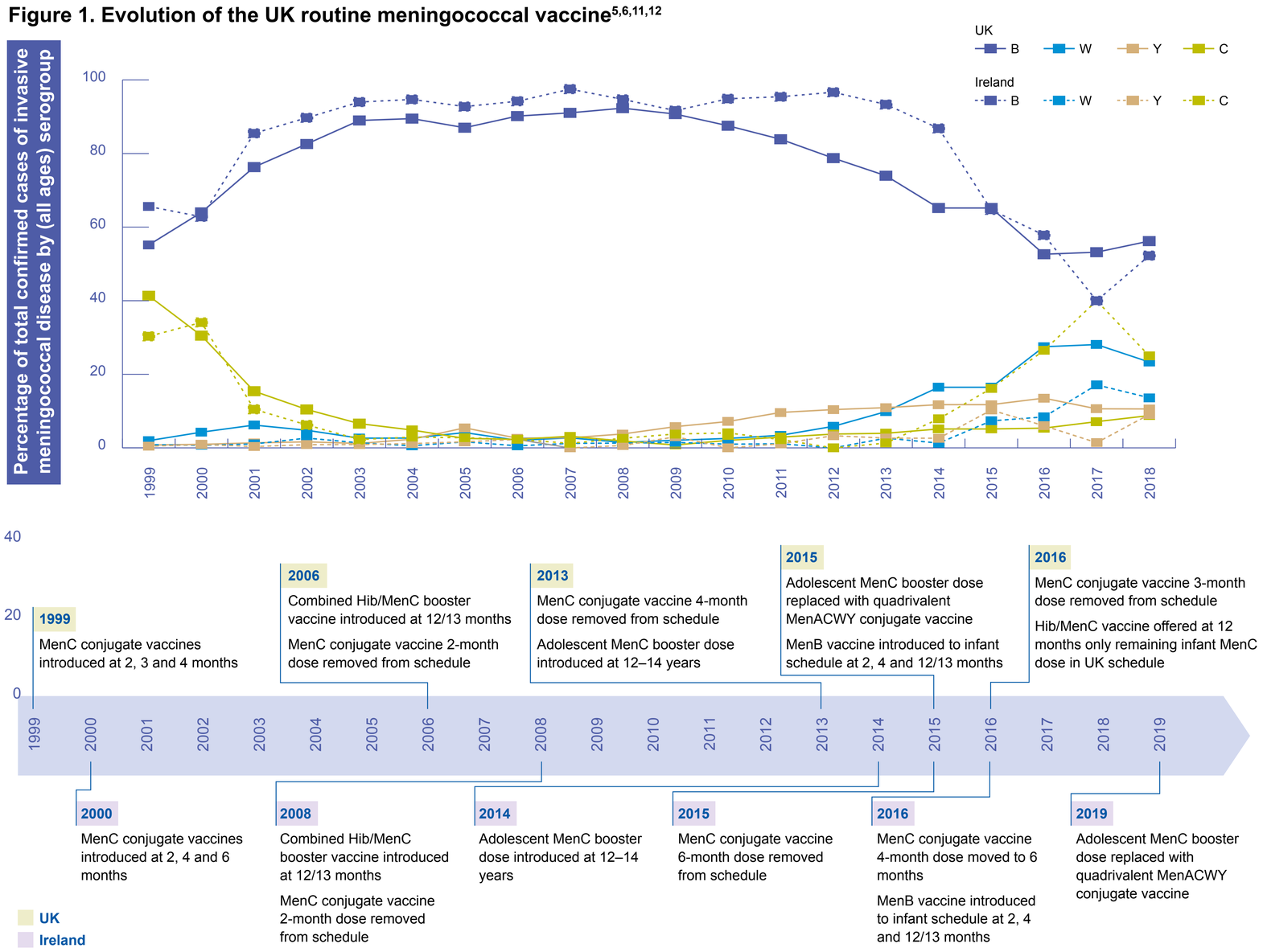
- From 2009, the incidence of MenW disease increased in the UK, with highest carriage rates and sustained transmission in adolescents[5]
- From 2016, the incidence of MenW and MenY disease increased in Ireland[6]
- In 2015 in the UK and 2019 in Ireland, the adolescent MenC vaccine was replaced with a quadrivalent MenACWY vaccine[5,6]
- The UK roll-out included a catch-up campaign for individuals aged <25 years[5]
- In England, it has been estimated that the adolescent MenACWY vaccine has indirectly prevented between 114 and 899 MenW cases in children <5-years-old during the first four years after its implementation[9]

Meningococcal B (MenB) vaccination

- Since introduction of the MenC vaccine in 1999, MenB has been the most common serogroup in the UK and Ireland, and in 2008 it accounted for almost 90% of IMD cases[10,11]
- Following licensure of the 4CMenB vaccine in Europe in 2013, it was introduced into the routine infant immunisation schedules at 2, 4, and 12 months of age in 2015 in the UK, and in 2016 in Ireland[7]
- In 2018 MenB accounted for <60% of total IMD in the UK and Ireland[12]

- Overall, IMD cases have continued to decline since the introduction of the vaccination schedules
- In England, during epidemiological year 2019/2020, there were 491 confirmed cases and 30 deaths from IMD (compared with 2,595 cases and 159 deaths in 1999/2000), of which MenB accounted for 66% of cases, MenW 17%, MenY 9%, and MenC 6%[13]
- Overall incidence has remained stable in England at 1/100,000 since 2011/2012[13]

Figure 1. Evolution of the UK routine meningococcal vaccine[5,6,11,12]



CONCLUSIONS

- Routine childhood vaccination against IMD in the UK and Ireland has led to significant reductions in clinical burden of this disease
- High vaccine uptake and continued disease surveillance are crucial to ensure optimum protection and prevention of IMD and enable modification of the schedule should new meningococcal strains emerge

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ABBREVIATIONS

Hib, *Haemophilus influenzae* type B;
IMD, invasive meningococcal disease;
MenACWY, meningococcal serogroups A, B, C and W;
MenB, meningococcal serogroup B;
MenC, meningococcal serogroup C;
MenY, meningococcal serogroup Y

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