Invasive Meningococcal Disease
- prevention through vaccination

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"a pain you cannot describe"
“Two weeks of Hell”
Petition

Give the Meningitis B vaccine to ALL children, not just newborn babies.

All children are at risk from this terrible infection, yet the Government plan to only vaccinate 2-5 month olds. There needs to be a rollout programme to vaccinate all children, at least up to age 11. Meningococcal infections can be very serious, causing MENINGITIS, SEPTICAEMIA & DEATH.

More details

Sign this petition

816,118 signatures

Show on a map
Vaccines against MenB

- MenC and MenACWY conjugate vaccines target the polysaccharide capsules – no cross-protection
- MenB polysaccharide is a polysialic acid - identical to that found on surface of human foetal neuronal cells.
- Consequently;
  (i) Poorly immunogenic.
  (ii) Potential to induce an autoimmune response
- Use subcapsular antigens, which:
  (i) are Surface-exposed
  (ii) are Conserved
  (iii) induce Bactericidal activity
Quality of life changes in children diagnosed with group B meningococcal disease in months following illness.
Predicted meningococcal strain coverage in Europe

Figure 1: Percentages of isolates predicted by the meningococcal antigen typing system to be covered, and number of antigens, overall and by country.
Invasive Meningococcal Disease
England & Wales, 2008-14
Laboratory confirmed cases of invasive meningococcal disease in England and Wales.
Laboratory confirmed cases of invasive meningococcal disease capsular group B (MenB) in England, calendar years 2009-2014

Date source: PHE Meningococcal Reference Unit. Surveillance by PHE Immunisation Department – Last Update August 2015
Please see link for more information and data https://www.gov.uk/government/collections/meningococcal-disease-guidance-data-and-analysis
Long term trends in notified meningococcal disease, England and Wales

Years


Number of notifications

0 2000 4000 6000 8000 10000 12000 14000

Cerebrospinal fever
Meningococcal infection
Meningococcal meningitis
Meningococcal meningitis and septicaemia
Trends in bacterial, mycobacterial, and fungal meningitis in England and Wales 2004–11: an observational study

Ifeanichukwu O Okike, Sonia Ribeiro, Mary E Ramsay, Paul T Heath, Mike Sharland, Shamez N Ladhani
Negotiations to procure at cost-effective price were concluded in late March 2015

MenB vaccine given with routine immunisation appointments from 1st September 2015

**Routine cohort:** infants born on or after the 1 July 2015  
**Schedule:** 2, 4 and 12 months (2+1)

**Catch-up cohort:** infants born from 1 May to 30 June 2015  
**Schedule:** 3, 4 and 12 months (2+1)  
**Schedule:** 4 and 12 months (1+1)
Laboratory confirmed IMD by group and age (2010-2014)
MenB cases/deaths, England 2014/15

![Graph showing the number of cases and deaths by age in years for MenB in England 2014/15.](image)

- **Survivors**
- **Deaths**

Number of Cases & Deaths

Age in Years

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
IMD in <2 year-olds
England & Wales (2006/07-2010/11)
Proportion of children with bactericidal antibody (GMT) to specific strains at different schedules

<table>
<thead>
<tr>
<th>Study</th>
<th>Schedule</th>
<th>44/76 fHBP</th>
<th>5/99 NadA</th>
<th>NZ 98/254 OMV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Findlow (≥1:4 hSBA)</td>
<td>2, 4, 6 m After third dose</td>
<td>95% (30)</td>
<td>95% (126)</td>
<td>85% (19)</td>
</tr>
<tr>
<td></td>
<td>2, 4 m After second dose</td>
<td>87% (28)</td>
<td>100% (104)</td>
<td>74% (6.6)</td>
</tr>
<tr>
<td>Gossger (≥1:5 hSBA)</td>
<td>2, 3, 4 m</td>
<td>99.3% (82)</td>
<td>100% (323)</td>
<td>81% (11)</td>
</tr>
</tbody>
</table>
Adverse reactions to 4CMenB

Bexsero® is associated with higher rates of local and systemic reactions when given with other routine infant vaccinations

- similar to those seen with whole cell pertussis vaccines

Systemic effects tend to be additive when given with other vaccines

For example, any fever was seen following:

- 26-41% of Bexsero® doses when administered alone,
- 23-36% after routine vaccines given alone
- 51-61% after Bexsero® and routine vaccines administered together
BEXSERO® Tolerability in Infants

Solicited systemic reactions when BEXSERO is given with routine vaccines—post–dose 1

*No increase in the incidence or severity of the adverse reactions was seen with subsequent doses of the vaccination series.
†Routine vaccines: PCV7 and DTaP-HBV-IPV/Hib; BEXSERO+Routine: N=2478; MenC+Routine: N=490; Routine: N=659.
‡ Fever was categorized as severe if temperature was ≥40°C. All other reactions were categorized as severe if subject was unable to perform normal daily activities.

Vaccine acceptability and attitudes to vaccination

Regular survey of parents attitudes to vaccination

Last conducted in 2010

Resurrected in 2015!

Additional research on MenB commissioned in 2014
Could you please tell me how serious the consequences of children getting each disease would be?

<table>
<thead>
<tr>
<th>Disease</th>
<th>2010 % Very serious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningitis</td>
<td>91%</td>
</tr>
<tr>
<td>Septicaemia (blood poisoning)</td>
<td>81%</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>68%</td>
</tr>
<tr>
<td>Polio</td>
<td>63%</td>
</tr>
<tr>
<td>Tetanus</td>
<td>40%</td>
</tr>
<tr>
<td>Diptheria</td>
<td>44%</td>
</tr>
<tr>
<td>Whooping cough</td>
<td>28%</td>
</tr>
<tr>
<td>Rubella/ German measles</td>
<td>41%</td>
</tr>
<tr>
<td>Measles (Not German)</td>
<td>29%</td>
</tr>
<tr>
<td>Mumps</td>
<td>28%</td>
</tr>
<tr>
<td>Hib</td>
<td>30%</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>n/a</td>
</tr>
<tr>
<td>Flu</td>
<td>8%</td>
</tr>
<tr>
<td>Diarrhoea and vomiting</td>
<td>12%</td>
</tr>
<tr>
<td>Chicken pox</td>
<td>11%</td>
</tr>
<tr>
<td>Ear infection</td>
<td>6%</td>
</tr>
</tbody>
</table>

Very serious:  
Fairly serious:  
Not very serious:  
Not at all serious:  
Does not know:  

83%  
78%  
71%  
69%  
52%  
52%  
47%  
44%  
38%  
36%  
36%  
25%  
22%  
18%  
17%  
14%
Specific research on MenB

Dr Cath Jackson, Valid Research
Dr Helen Bedford, UCL Institute of Child Health

- Most parents were unfamiliar with the term ‘meningococcal disease’ but had generally heard of ‘meningitis’
- Most parents had not heard of the MenB vaccine (whereas they knew that the schedule included a MenC vaccine)
- MenC programme is well established; information about MenB only needed because it’s a new vaccine
- Most parents liked leaflets in the Q+A format, some parents happy with the 2 minute guide, others preferred a longer version
- Parents worry about fever and consequences (in a 2 month old)
  - But better for child to have fever than meningitis
  - To some extent parents expect fever with immunisation.
When Fever Occurred, it Generally Followed a Predictable Pattern, With the Majority Resolving the Day After Vaccination

*BEXSERO® given with routine vaccines—post–dose 1*

Post–dose 1
(2-4-6 month dosing schedule)

% of infants

- ≥40° C
- 39° C—<40.0° C
- 38.5° C—<39° C

*Routine vaccines: PCV7 and DTaP-HBV-IPV/Hib; BEXSERO+Routine: N=2433–2478; MenC+Routine: N=486–490; Routine only: N=643–659.

Fever was defined as rectal temperature ≥38.5° C.

In general, the frequency of medically attended fever was low

**Percentage of Subjects With Medically Attended Fever**
(Number of Subjects With Medically Attended Fever/Total Number of Subjects)

<table>
<thead>
<tr>
<th></th>
<th>BEXSERO® Vaccine + Routine Vaccines*</th>
<th>MenC+ Routine Vaccines*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observer-Blind Subset</strong></td>
<td>5.3% (26/493)</td>
<td>2.8% (13/470)</td>
</tr>
<tr>
<td><strong>Open-Label Subset</strong></td>
<td>1.4% (28/1966)</td>
<td>1.8% (12/659)</td>
</tr>
</tbody>
</table>

* *Routine vaccines: PCV7 and DTaP-HBV-IPV/Hib.*

Use of antipyretic agents

Effect of prophylactic paracetamol administration at time of vaccination on febrile reactions and antibody responses in children: two open-label, randomised controlled trials

Roman Prymula, Claire-Anne Siegrist, Roman Chlibek, Helena Zemlickova, Marie Vackova, Jan Smetana, Patricia Lommel, Eva Kaliskova, Dorota Borys, Lode Schuerman

In 2010, JCVI recommended that paracetamol should not be routinely offered to infants to prevent fever because it may interfere with vaccine responses
Prophylactic Paracetamol at the Time of and Closely After Vaccination Reduced Fever
When BEXSERO® is given concomitantly with routine infant vaccines

NPP: no prophylactic paracetamol (N=182); PP: with prophylactic paracetamol (N=178-179).
Routine vaccines: PCV7 and DTaP-HBV-IPV/Hib.

Prophylactic Paracetamol at the Time of and Closely After Vaccination Did Not Impact Immunogenicity of BEXSERO®

BEXSERO given concomitantly with routine infant vaccines 2-3-4 month schedule

- **BEXSERO+routine at baseline**
- **BEXSERO+routine+paracetamol at baseline**
- **BEXSERO+routine at 1 month post-final dose**
- **BEXSERO+routine+paracetamol at 1 month post-final dose**

**Infants with hSBA ≥1:5 (%)**

<table>
<thead>
<tr>
<th></th>
<th>BEXSERO+routine at baseline</th>
<th>BEXSERO+routine+paracetamol at baseline</th>
<th>BEXSERO+routine at 1 month post-final dose</th>
<th>BEXSERO+routine+paracetamol at 1 month post-final dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>fHbp</td>
<td>100</td>
<td>100</td>
<td>99</td>
<td>74</td>
</tr>
<tr>
<td>NadA</td>
<td>99</td>
<td>99</td>
<td>99</td>
<td>78</td>
</tr>
<tr>
<td>PorA P1.4</td>
<td>100</td>
<td>100</td>
<td>99</td>
<td>74</td>
</tr>
<tr>
<td>NHBA</td>
<td>78</td>
<td>74</td>
<td>NT</td>
<td>NT</td>
</tr>
</tbody>
</table>

*N=165–171; †N=160–169.
Routine vaccines: PCV7 and DTaP-HBV-IPV/Hib.
NT=not tested.

Systematic review in 2014

The effect of prophylactic antipyretic administration on adverse reactions and antibody response in children

Also reduction in
- Pain, swelling and redness at injection site
- Irritability, drowsiness, persistent crying and loss of appetite
- Although reduction in antibody was observed, size of reduction was considered unlikely to result in clinically significant reduction in protection

Das RR et al PLoS ONE 9(9): e106629. doi:10.1371/journal.pone.0106629
# Timing of paracetamol doses with other infant vaccines

<table>
<thead>
<tr>
<th></th>
<th>PCV13 + Infanrix Hexa + Paracetamol Twice Daily</th>
<th>PCV13 + Infanrix Hexa + Ibuprofen Twice Daily</th>
<th>PCV13 + Infanrix Hexa + Paracetamol Thrice Daily</th>
<th>PCV13 + Infanrix Hexa + Ibuprofen Thrice Daily</th>
<th>PCV13 + Infanrix Hexa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Participants</td>
<td>149</td>
<td>157</td>
<td>147</td>
<td>155</td>
<td>187</td>
</tr>
<tr>
<td>Percentage of Participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reporting Fever Within 4 Days:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever ≥38 - ≤39 °C</td>
<td>32.9</td>
<td>45.2</td>
<td>18.4</td>
<td>34.2</td>
<td>41.7</td>
</tr>
<tr>
<td>Fever &gt;39, ≤40 °C</td>
<td>1.4</td>
<td>1.4</td>
<td>0.7</td>
<td>0.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Fever &gt;40 °C</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Clinical Trials.gov: Study Assessing the Effect of Medications to Prevent Fever on Prevenar 13®**

Summary of evidence on paracetamol

- Fever is common after Bexsero® and fever rates are additive to those normally seen after infant vaccines
  - Concern about high rate of medical attendance
  - Fever peaks at six hours after vaccine, uncommon after 48 hours
- Rates and intensity of fever reduced by prophylactic paracetamol
  - Immunogenicity of concomitant infant vaccines not reduced when given with paracetamol and Bexsero®
- Studies with other infant vaccines show
  - Paracetamol also reduces other systemic and local reactions
  - three doses of paracetamol starting immediately is better than two doses starting at 6 hours (suggests first dose is the most important)
  - Paracetamol superior to ibuprofen in preventing fever and symptoms
Your guide

Protecting your baby against meningitis and septicaemia

caused by meningococcal B bacteria

MenB vaccine now available!

Protecting your baby against meningitis and septicaemia

caused by meningococcal B bacteria

MenB vaccine now available!

Information about the MenB vaccine and recommended paracetamol use

Immunisation

The safest way to protect the health of your baby
1. Too Early To Tell
2. Vaccine offered for only 8 months so far
3. Infants in the first 2 months of life (0-2 months) will not be protected
4. Only 70 cases in vaccine eligible infants in 2014/15 (pre-vaccine)
5. MenB cases falling naturally for past 15 years
6. Half the cases (50%) diagnosed by PCR only – limited strain info.
7. Culture-confirmed cases need MATS testing in reference laboratory – takes several weeks
8. So far, 400,000 babies immunised, 8 cases after 1 dose, 1 case after 2 doses

=> We are already seeing a greater-than-predicted reduction in MenB cases in the vaccine eligible infants and not in the other age groups
How has it gone?

Vaccine eligibility

• Children getting MenB “booster” at 12 months of age in absence of primary course
• Children born after 1\textsuperscript{st} May who had already completed their primary course
  • Eligible under contract but not being actively called
• Confusion between catch-up cohorts and those in eligible cohort who present late (e.g. movements from abroad)
• Requests for children who had started private vaccinations
• Very few calls after first few weeks
How has it gone?

Use of paracetamol

- Nurses wanting to administer during vaccination clinic
- Parents taking before come in to see the nurse
- How long to wait (could they wait to get cheaper product in local supermarket)
- Pharmacists refusing to sell because outside product license
- Premature and small for dates babies
  - Need individual prescription
  - Neonatal units refusing to give paracetamol
- Very few calls after first few weeks
1. The UK is the first country to introduce routine MenB vaccine

2. Post marketing surveillance will be essential to provide international experience for other to build on

3. MenB implementation in the UK is built on successful infant programme in general practice

4. The vaccine should protect against 73-88% of MenB cases in vaccinated infants and toddlers

5. Recommending paracetamol prophylaxis has been challenging but, so far, successful

6. The programme is supported by range of communication materials

7. No significant concerns in the first 6 months of the programme
Immunisation information for health professionals and immunisation practitioners.

Contents
- Documents

Immunisation is the most important way of protecting individuals and the community from vaccine preventable infectious diseases.

‘Immunisation against infectious disease’, also known as the Green Book, has
Resources for health professionals and patients

- PHE MenB Health Care Worker Q+A
- PHE MenB vaccine leaflet (long version)
- PHE MenB vaccine leaflet: 3 minute guide
- PHE MenACWY vaccination programme patient information leaflet and posters
- PHE MenACWY Health Care Worker Q+A
- PHE Paracetamol Patient Information Leaflet
- Training the trainer slide sets and animated voice over
- OVG video on parent consultation

- Meningitis Research Foundation:  http://www.meningitis.org/
- Meningitis Now.  https://www.meningitisnow.org/
Acknowledgements

- Mary Ramsay
- MenB/ACWY Project Board
- Matthew Olley, Vanessa Saliba, Helen Campbell, Ray Borrow, at PHE
- Jim Wassil, Novartis Vaccines
- Phil Bryan MHRA
- Hannah Christensen, University of Bristol
Controlling the increase in Meningococcal group W disease
Laboratory confirmed cases of meningococcal group W (MenW) disease in England, 2005/06-2014/15

Date source: PHE Meningococcal Reference Unit. Surveillance by PHE Immunisation Department – Last Update August 2015
Please see link for more information and data https://www.gov.uk/government/collections/meningococcal-disease-guidance-data-and-analysis
MenW cases by age group

England, 2010/11-2014/15*

* data available until end May 2015
<table>
<thead>
<tr>
<th></th>
<th>&lt;5 n=32</th>
<th>5-19 n=21</th>
<th>20-44 n=12</th>
<th>45-64 n=26</th>
<th>≥65 n=38</th>
<th>All cases n=129</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recent Travel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2*</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Risk Factors</strong></td>
<td>1 (3%)</td>
<td>-</td>
<td>2 (17%)</td>
<td>2 (8%)</td>
<td>7 (18%)</td>
<td>12 (9%)</td>
</tr>
<tr>
<td><strong>Malignancy</strong></td>
<td>1 (3%)</td>
<td>-</td>
<td></td>
<td>-</td>
<td>6 (16%)</td>
<td>7 (5%)</td>
</tr>
<tr>
<td><strong>HIV-positive</strong></td>
<td>-</td>
<td>-</td>
<td>1 (8%)</td>
<td>2 (8%)</td>
<td>-</td>
<td>3 (2%)</td>
</tr>
<tr>
<td><strong>Immunosuppressive drug</strong></td>
<td>-</td>
<td>-</td>
<td>1 (8%)</td>
<td>-</td>
<td>1 (2%)</td>
<td>2 (2%)</td>
</tr>
<tr>
<td><strong>Comorbidities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other comorbidity</strong></td>
<td>1 (3%)</td>
<td>2 (10%)</td>
<td>-</td>
<td>2 (8%)</td>
<td>7 (18%)</td>
<td>12 (9%)</td>
</tr>
<tr>
<td><strong>Clinical Presentation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Septicaemia</strong></td>
<td>17 (53%)</td>
<td>9 (43%)</td>
<td>6 (50%)</td>
<td>12 (46%)</td>
<td>19 (50%)</td>
<td>63 (49%)</td>
</tr>
<tr>
<td><strong>Septicaemia &amp; Meningitis</strong></td>
<td>6 (19%)</td>
<td>5 (24%)</td>
<td>3 (25%)</td>
<td>2 (8%)</td>
<td>5 (13%)</td>
<td>21 (16%)</td>
</tr>
<tr>
<td><strong>Meningitis</strong></td>
<td>4 (13%)</td>
<td>4 (19%)</td>
<td>2 (17%)</td>
<td>4 (15%)</td>
<td>2 (5%)</td>
<td>16 (12%)</td>
</tr>
<tr>
<td><strong>Pneumonia</strong></td>
<td>-</td>
<td>2 (10%)</td>
<td>-</td>
<td>6 (23%)</td>
<td>7 (18%)</td>
<td>15 (12%)</td>
</tr>
<tr>
<td><strong>Septic arthritis</strong></td>
<td>4 (13%)</td>
<td>1 (5%)</td>
<td>-</td>
<td>1 (4%)</td>
<td>3 (8%)</td>
<td>9 (7%)</td>
</tr>
<tr>
<td><strong>Epiglottitis/supraglottitis</strong></td>
<td>1 (3%)</td>
<td>-</td>
<td>1 (8%)</td>
<td>1 (4%)</td>
<td>2 (5%)</td>
<td>5 (4%)</td>
</tr>
<tr>
<td><strong>ICU admission</strong></td>
<td>11 (34%)</td>
<td>10 (48%)</td>
<td>6 (50%)</td>
<td>10 (38%)</td>
<td>11 (29%)</td>
<td>48 (37%)</td>
</tr>
<tr>
<td><strong>Deaths</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>All deaths</strong></td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>19 (15%)</td>
</tr>
</tbody>
</table>
Presentation with gastrointestinal symptoms and high case fatality associated with MenW in teenagers

<table>
<thead>
<tr>
<th>Sex</th>
<th>History and clinical features</th>
<th>Initial Assessment</th>
<th>IMD suspected</th>
<th>ITU</th>
<th>Outcome</th>
<th>Confirmation</th>
<th>Final Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>2 days D&amp;V, stomach cramps lethargy, no rash</td>
<td>Saw GP on Day 1, Sudden deterioration Day 2, rapid progression in A&amp;E; “? abdominal sepsis”</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Died in A&amp;E</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>1 day vomiting then diarrhoea and sore limbs; no rash</td>
<td>Saw GP, sent home with gastroenteritis diagnosis; Came to A&amp;E later same day, isolated to a side-room</td>
<td>PCR blood</td>
<td>ITU</td>
<td>Died in A&amp;E within 30 min</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1 day D&amp;V, flu - like illness, then deteriorated rapidly</td>
<td>Profoundly septic with seizures on admission, then became comatose</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Died in ITU next day</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3 days headache &amp; vomiting; 1 day diarrhoea</td>
<td>Found collapsed at home, Rushed to A&amp;E. Petechial rash on back</td>
<td>PCR blood</td>
<td>ITU</td>
<td>Died in ITU same day</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1 day D&amp;V, fever, headache</td>
<td>Developed rash after hospital admission; initial blood culture and CSF meningococcal PCR negative; blood PCR sent later and was positive (12 days after onset)</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Survived</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1 day D&amp;V, abdominal pain</td>
<td>Saw GP on day of illness, went to A&amp;E next day; hypotensive, tachycardic, petechiae on face</td>
<td>PCR blood</td>
<td>ITU</td>
<td>Survived</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Generally unwell for 1 week; fever, short of breath, general aches (no rash)</td>
<td>Presented to A&amp;E with transient ischaemic attacks, developed pulmonary embolism</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Cardiac arrest in A&amp;E</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>1 day of high fever, mild headache, nausea (no rash)</td>
<td>Admitted for 24 hours only. Diagnosis confirmed by blood culture after discharge</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Survived</td>
<td>Septicaemia</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>2 hours fever, sore throat, stiff neck and headache, with purpuric rash.</td>
<td>Presented directly to A&amp;E, admitted to ITU but improved within 3 days</td>
<td>CSF culture</td>
<td>ITU</td>
<td>Survived</td>
<td>Meningitis and Septicaemia</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Fever, neck pain, aches – improved, then had painful wrist joint 3 days later</td>
<td>Saw GP with painful wrist and was referred to hospital. Wrist washed out</td>
<td>PCR Joint fluid</td>
<td>ITU</td>
<td>Survived</td>
<td>Septic arthritis</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3 days fever, vomiting, hip and elbow joint pain</td>
<td>Treated with IV antibiotics, no orthopaedic intervention</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Survived</td>
<td>Septic Arthritis</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Fever, malaise and respiratory distress</td>
<td>Radiologically confirmed pneumonia</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Survived</td>
<td>Pneumonia</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3 days fever, headache, coryza. 1 day vomiting and coughing blood</td>
<td>Radiologically confirmed pneumonia</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Survived</td>
<td>Pneumonia</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5 days sore throat, fatigue, lethargy, lymphadenopathy; no fever, no rash</td>
<td>Seen at hospital and blood cultures taken but was not hospitalised; received ambulatory intravenous antibiotics</td>
<td>Blood culture</td>
<td>ITU</td>
<td>Survived</td>
<td>Atypical</td>
<td></td>
</tr>
</tbody>
</table>

7/15 cases (6 females) presented with D&V symptoms

4/7 cases seen by GP or A&E on the day of illness

IMD suspected in only 2/7 cases

5/7 died:
- 3 in A&E
- 2 in ITU (<24 hrs)

MenW isolated from blood (2 culture / 5 PCR) in all cases

Remaining 8/15 cases:
- 2 septicaemia, 1 died in A&E (MenW from 2 blood culture)
- 1 meningitis & septicaemia (MenW from CSF PCR)
- 2 septic arthritis (MenW from 2 blood culture, 1 PCR joint fluid)
- 2 pneumonia (MenW from 2 blood culture)
- 1 atypical presentation (No fever, Men W from blood culture)
Strategy to control MenW

Wide age range affected

- Incidence highest in infants and adolescents
- Still high number of cases in older adults

Strategy in Chile of vaccinating children, only impacted on vaccinated age group

- Failed to control overall disease rates

Only feasible strategy is to target carriers with conjugate ACWY vaccine

- Plan to immunise adolescents
- Vaccinating older cohorts in catch up will accelerate control
JCVI recommendations: February 2015

• Even though the number of cases is low, JCVI considered this situation a public health emergency
  • rapid increase in virulent MenW
  • international experience (e.g. South America)

• The MenACWY programme will have direct impact on vaccinated teenage cohorts (second highest incidence group)
  • Excellent protection expected after a single dose

• Importance of completing catch-up quickly: to generate herd protection across the age range and slow the rate of increase
### Serum bactericidal antibody killing of UK W cc11 strains by serum from infants immunised with Bexsero®

<table>
<thead>
<tr>
<th>Lab number</th>
<th>Site</th>
<th>Type</th>
<th>Pre</th>
<th>Pool1</th>
<th>Pool2</th>
<th>Pool3</th>
<th>Pool4 Post 4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>M11-240756</td>
<td>Blood</td>
<td>W:NTP1.5,2 cc11</td>
<td>&lt;2</td>
<td>&gt;64</td>
<td>&gt;64</td>
<td>&gt;64</td>
<td>&gt;128</td>
</tr>
<tr>
<td>M12-240754</td>
<td>Blood</td>
<td>W:NTP1.5,2 cc11</td>
<td>&lt;2</td>
<td>64</td>
<td>64</td>
<td>&gt;64</td>
<td>&gt;64</td>
</tr>
</tbody>
</table>

This work suggests that children immunised with Bexsero may have some protection against the emerging strain of MenW.
Recommended vaccines

• Menveo® is supplied in 5 dose pack (powder in a vial and solution in a vial = 10 vials per pack), no needles.

• Nimenrix® is supplied in single pack as a powder in a vial (MenACWY) and 0.5ml solvent in a pre-filled syringe. Two needles are included.
# ACWY programme – planned roll-out

<table>
<thead>
<tr>
<th>Birth cohort</th>
<th>2014/15 year - age</th>
<th>Academic year</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/09/2003-31/08/2004</td>
<td>Y6 – 10/11</td>
<td></td>
</tr>
<tr>
<td>01/09/2002-31/08/2003</td>
<td>Y7 - 11/12</td>
<td></td>
</tr>
<tr>
<td>01/09/2001-31/08/2002</td>
<td>Y8 - 12/13</td>
<td></td>
</tr>
<tr>
<td>01/09/2000-31/08/2001</td>
<td>Y9 - 13/14</td>
<td></td>
</tr>
<tr>
<td>01/09/1999-31/08/2000</td>
<td>Y10 - 14/15</td>
<td></td>
</tr>
<tr>
<td>01/09/1998-31/08/1999</td>
<td>Y11 - 15/16</td>
<td></td>
</tr>
<tr>
<td>01/09/1997-31/08/1998</td>
<td>Y12 - 16/17</td>
<td></td>
</tr>
<tr>
<td>01/09/1996-31/08/1997</td>
<td>Y13 – 17/18</td>
<td></td>
</tr>
</tbody>
</table>

**Key**
- Routine schedule MenC
- Routine schedule ACWY
- School based catch-up ACWY
- Primary care catch-up cohorts
- Delivery mechanism to be decided
- Completed
New information for students in schools and sixth form colleges

MENINGITIS AND SEPTICAEMIA

You may have heard of MenC and MenB as causes of meningitis and septicaemia – now there’s an increase in MenW infection as well

- Meningitis and septicaemia are diseases that can kill very quickly
- Cases caused by meningococcal W (MenW) bacteria are increasing in the UK
- All age groups are being affected but adolescents and young adults are the most common carriers of the disease
- A vaccination programme for all those aged 14 to 17 (inclusive) is being introduced to reduce the spread of the disease
- The vaccine used will be MenACWY and the programme will start in schools in September 2015
- Even if you have already had a MenC vaccine you should have the MenACWY vaccine
- If you’re in years 10 to 13 you’re in a high-risk group, so make sure you don’t miss out on your vaccination
- Look out for the vaccination team visiting your school between September 2015 and July 2016
- If you are going to university in 2015, then register with a GP as soon as you arrive and they will give you the vaccination there
Cumulative MenW cases by epidemiological year (July to June) in England

January 2015/16 only includes provisional data to the 15th of the month
Confirmed MenW cases to 31 December, last 5 epi years by age group, England
Two major programmes to vaccinate the UK population against meningococcal disease were launched in 2015.

The UK will be the first country to introduce routine MenB vaccine.

Post marketing surveillance will be essential to provide international experience for other to build on.

Vaccines are expected to be largely acceptable to parents and health care staff.

MenB implementation will build on successful infant programme in general practice.

ACWY programme is likely to less successful in older age groups, due to low awareness and concern.

Programmes are supported by range of communication materials.
Resources for health professionals and patients

- PHE MenB Health Care Worker Q+A
- PHE MenB vaccine leaflet (long version)
- PHE MenB vaccine leaflet: 3 minute guide
- PHE MenACWY vaccination programme patient information leaflet and posters
- PHE MenACWY Health Care Worker Q+A
- PHE Paracetamol Patient Information Leaflet
- Training the trainer slide sets and animated voice over
- OVG video on parent consultation

- Meningitis Research Foundation: http://www.meningitis.org/
- Meningitis Now. https://www.meningitisnow.org/
Immunisation information for health professionals and immunisation practitioners.

Immunisation is the most important way of protecting individuals and the community from vaccine preventable infectious diseases.

‘Immunisation against infectious disease’, also known as the Green Book, has
Acknowledgements

- Mary Ramsay
- MenB/ACWY Project Board
- Matthew Olley, Vanessa Saliba, Helen Campbell, Ray Borrow, at PHE
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- Phil Bryan MHRA
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