

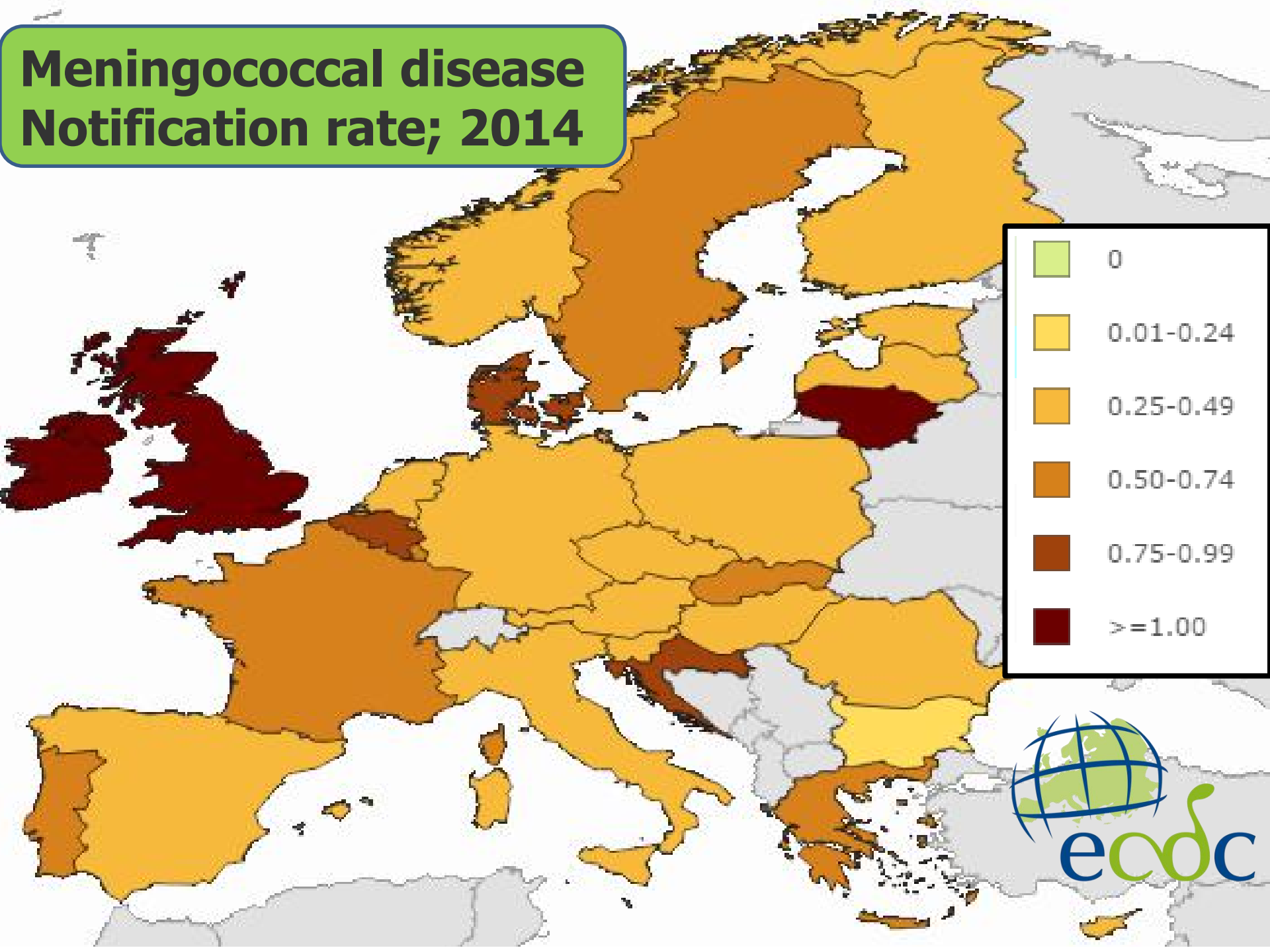
Declaration of Interest

- These are my views – not those of JCVI
- Watch out for:
 - Corporate slides

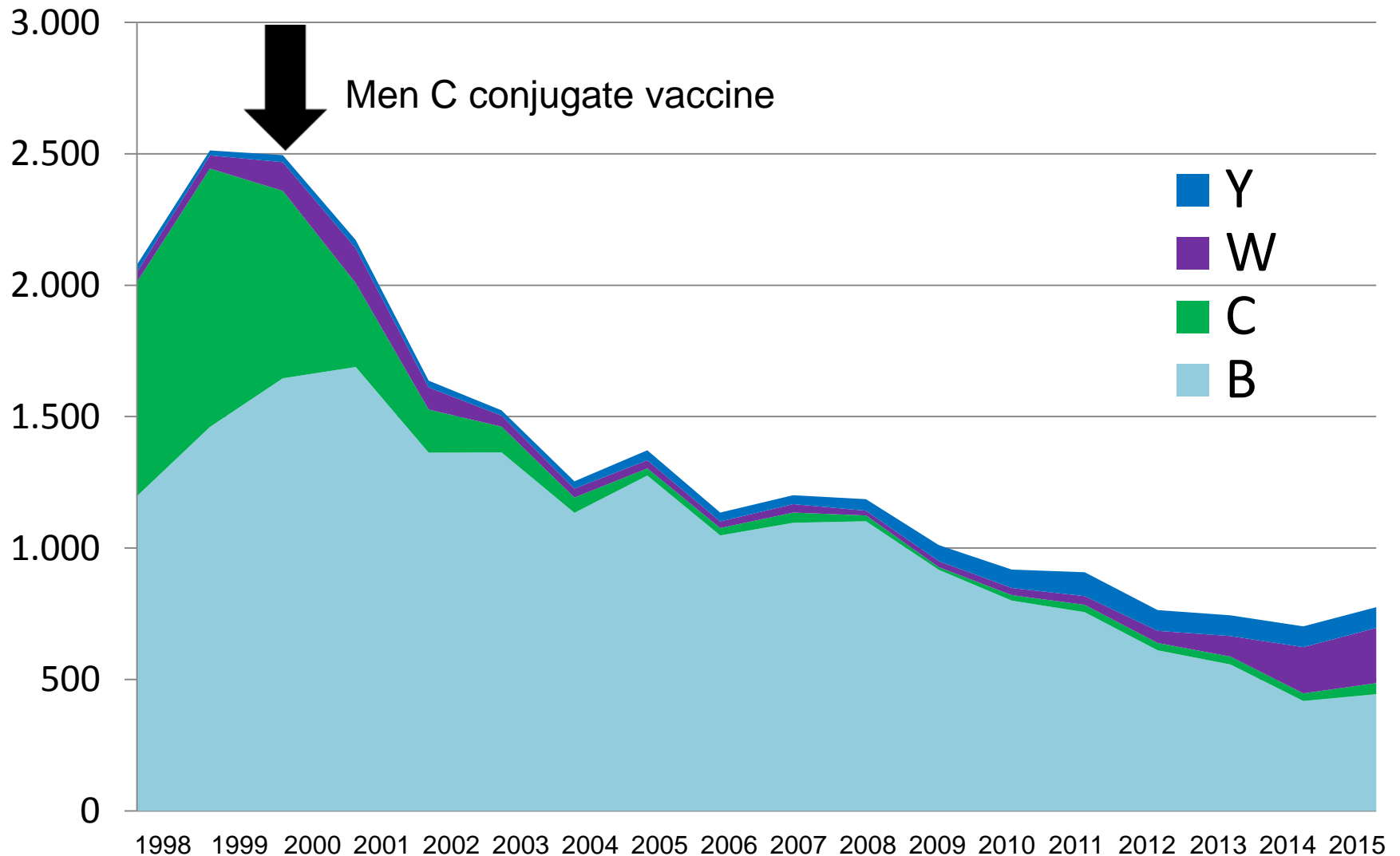
Quadrivalent meningococcal ACWY conjugate vaccine. The role of adolescents



Meningococcal disease Notification rate; 2014



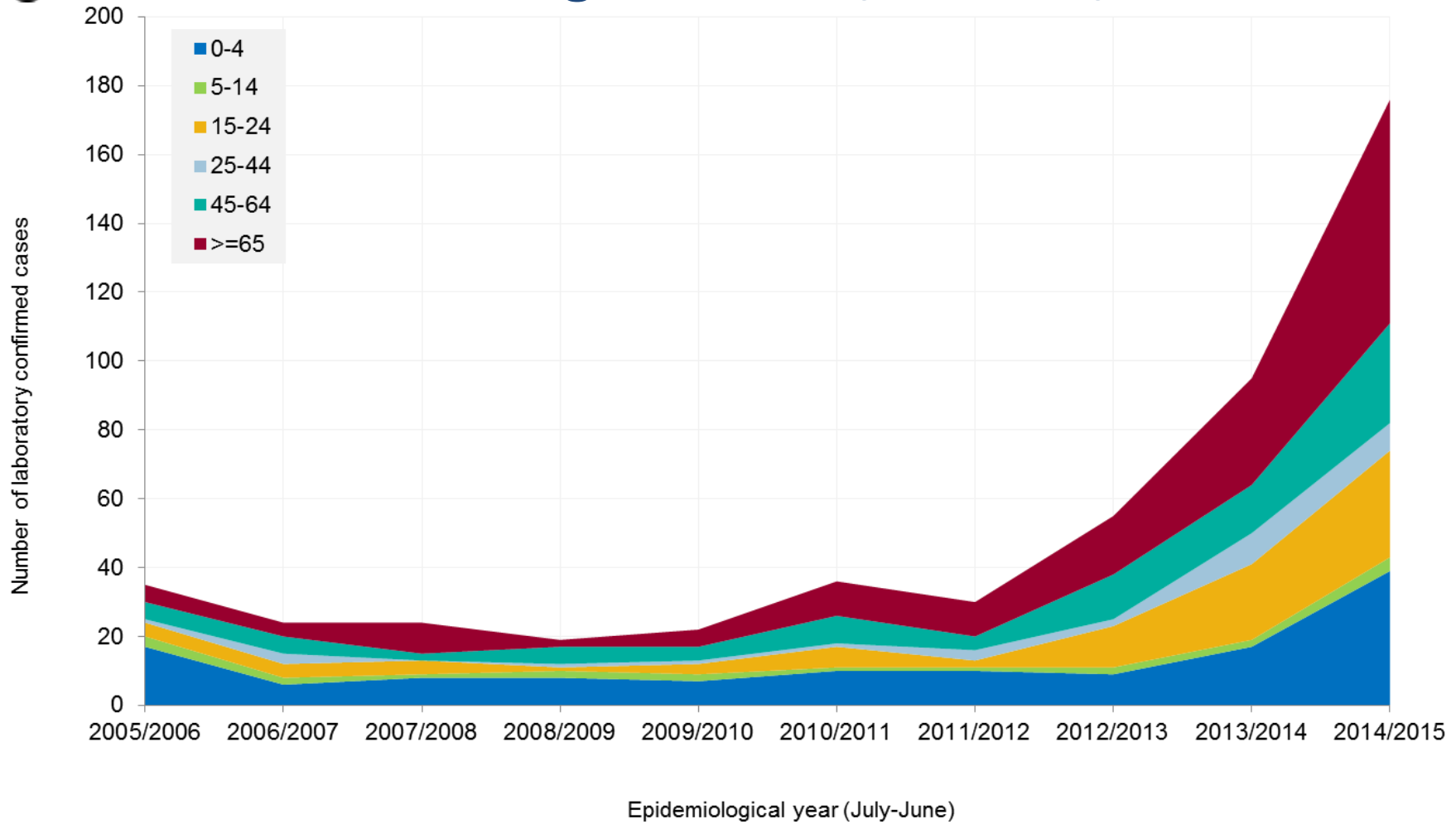
Invasive meningococcal infections, England 1998-2015





Public Health
England

Laboratory confirmed cases of meningococcal serogroup W disease in England, 2005/06-2014/15

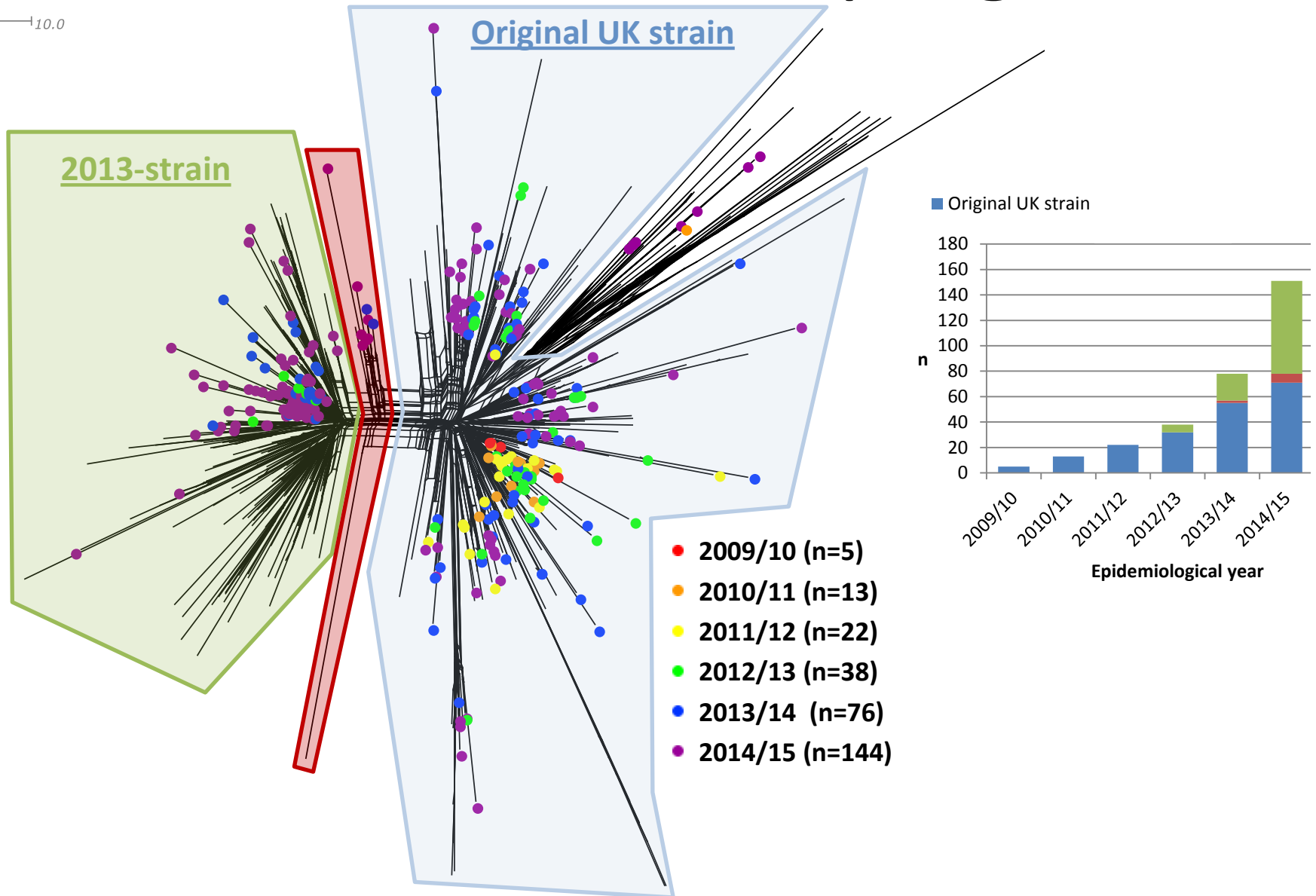




Emergence of MenW in England

- Associated with emergence of clone
W 2a:1.5,2 = **ST-11 clonal complex**
- Similar to that causing disease in South America
- Associated with increase in disease incidence and high case fatality ratios in recent years
 - As group C, in UK and Europe in late 1990s
 - As group W, Hajj-associated outbreak early 2000s
 - As group W, African epidemics 2002-2004
 - As group W, in S. America and S. Africa

Outbreak progression

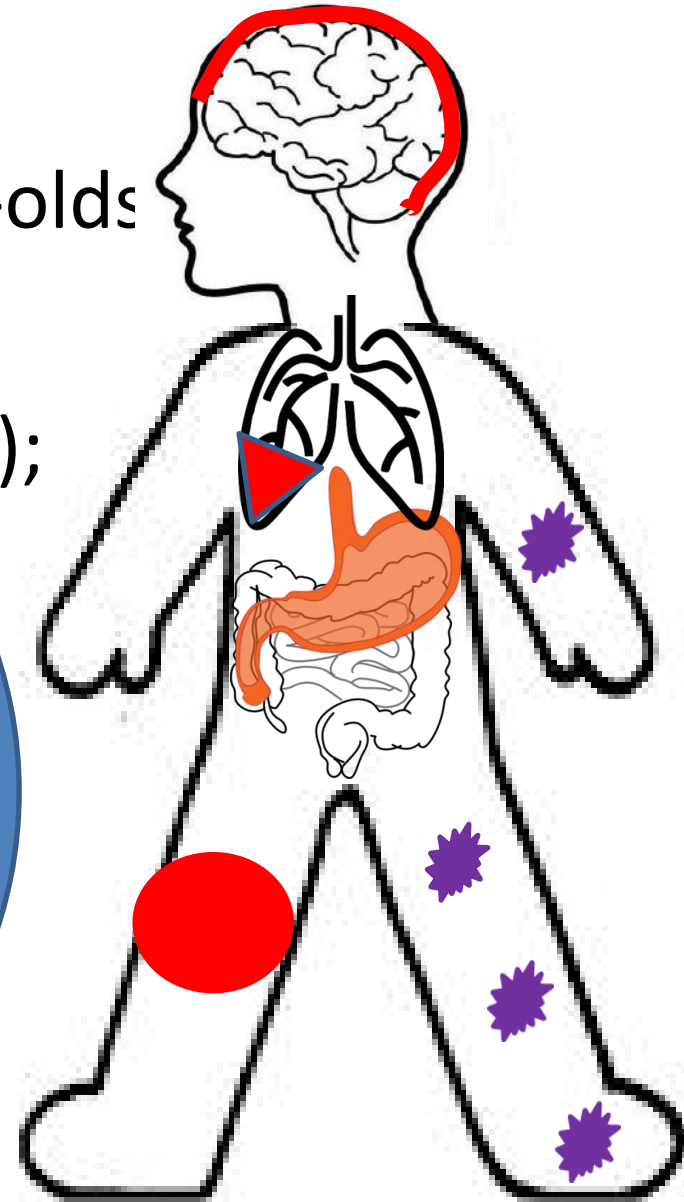


New Meningococcal W strain in 15 teenagers

Group W cases in 15 to 19 year-olds
July 2015 and January 2016

- 7 presented (rash);
- 5 died
- 3 septi
- 2 septi
- 2 pneu
- 1 mening

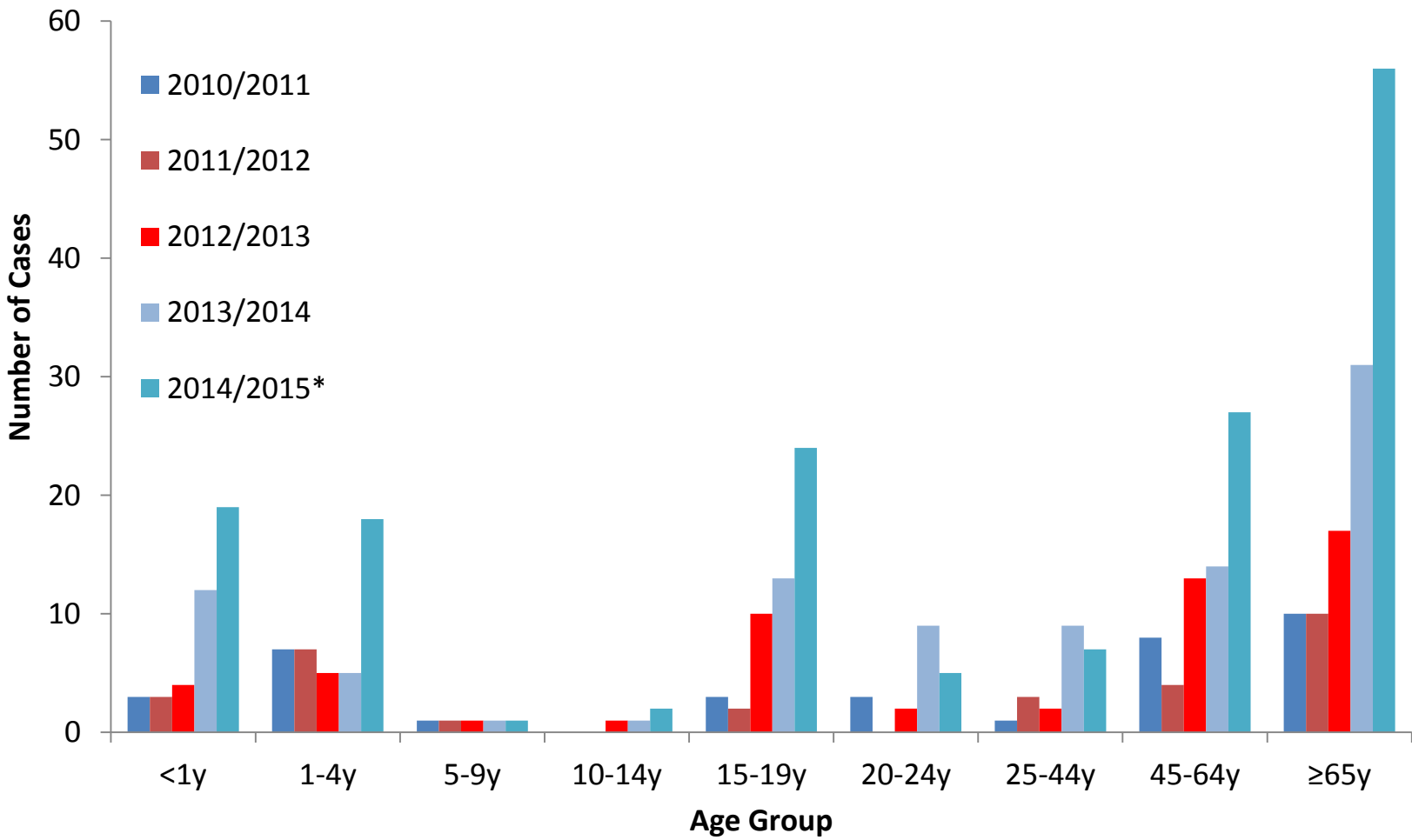
Atypical
presentations
more common
with Men W





Public Health
England

Serogroup W cases by age group England, 2010/11 to 2014/15

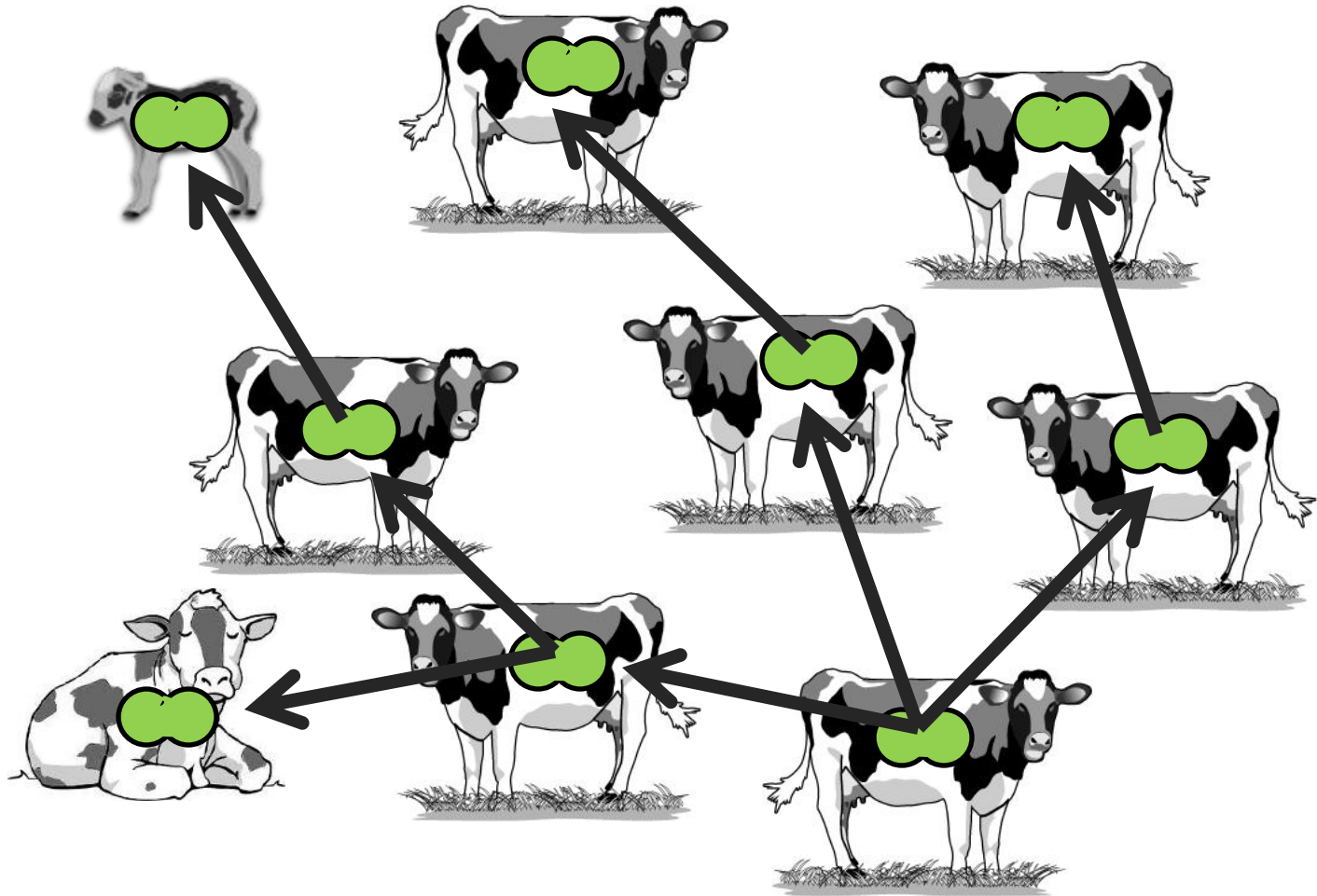




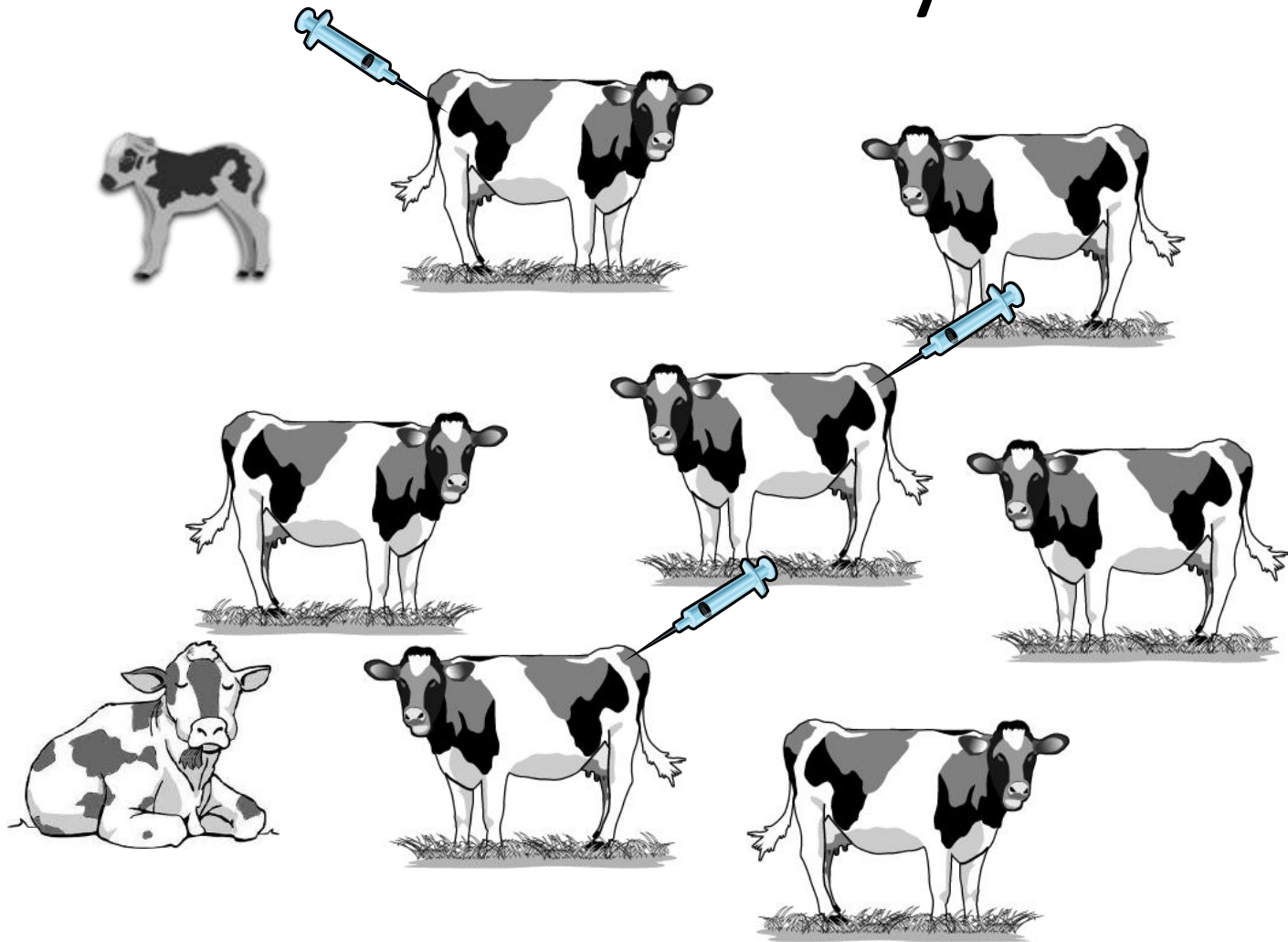
Strategy to control MenW disease

- Wide age range affected
 - Incidence highest in infants and adolescents
 - High number of cases in older adults
- Vaccinating children in Chile, only impacted on vaccinated age group
- Only feasible strategy is to target carriers with conjugate ACWY vaccine
 - plan to immunise adolescents

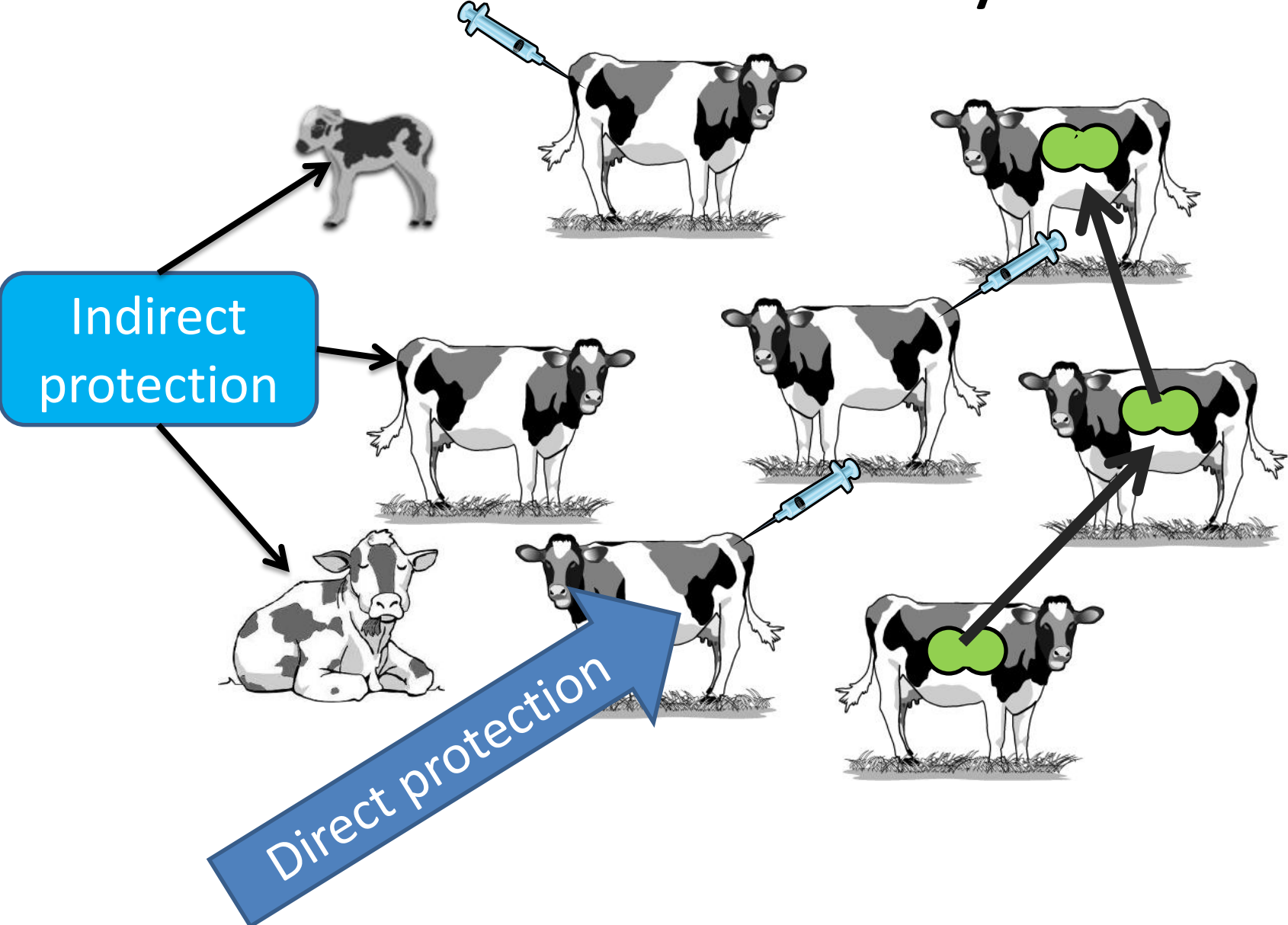
Herd Immunity



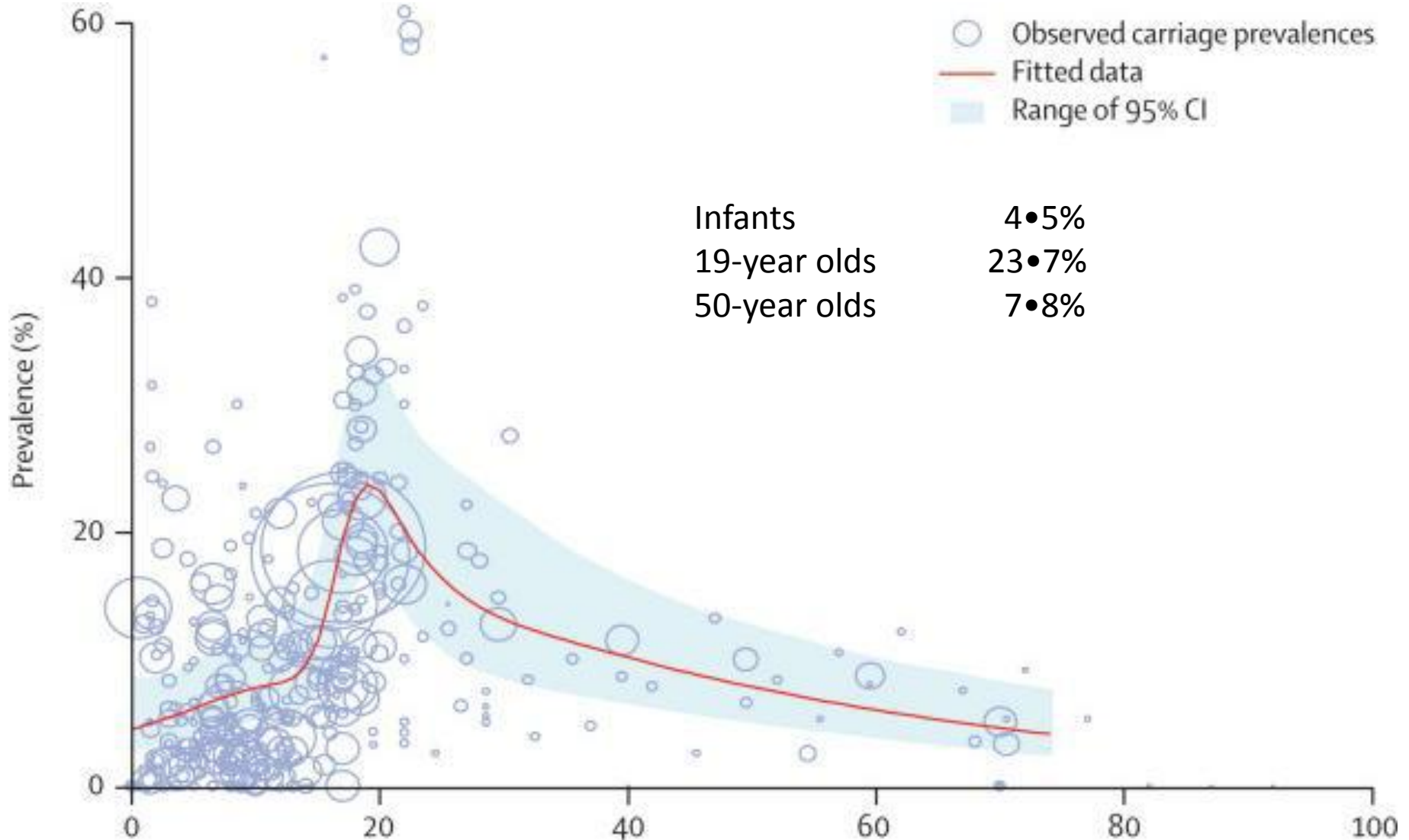
Herd Immunity



Herd Immunity

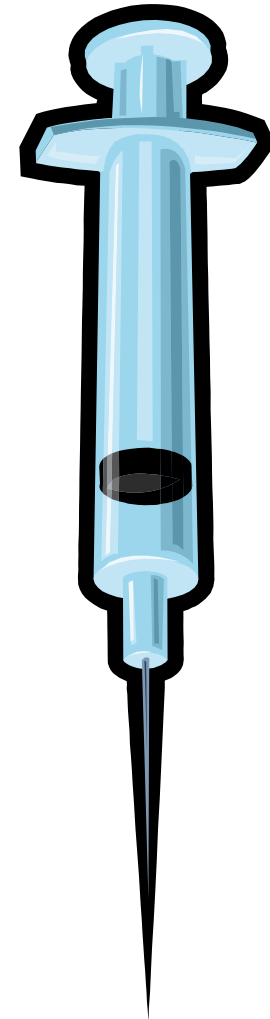
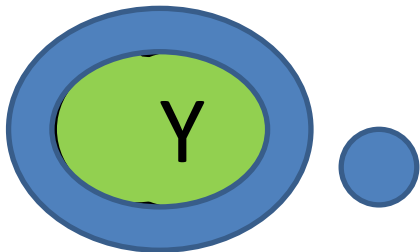
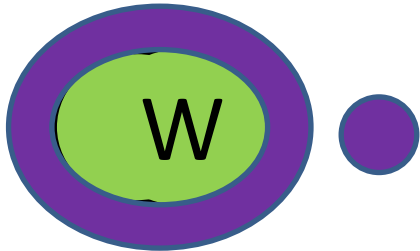
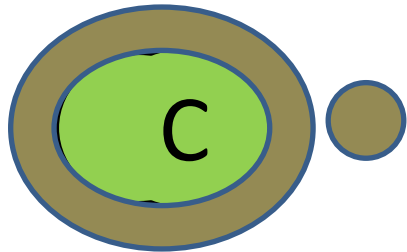
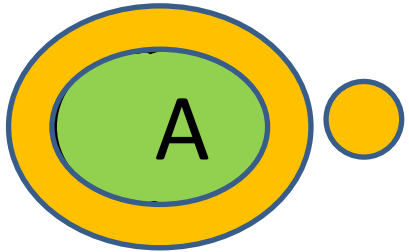


Meningococcal carriage by age



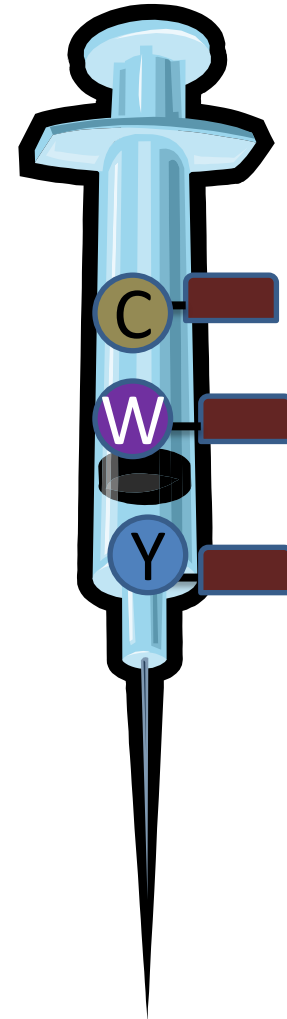
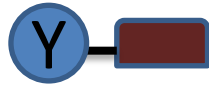
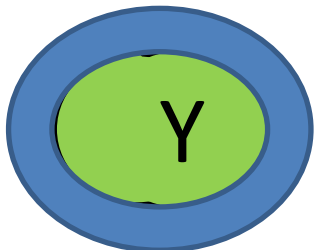
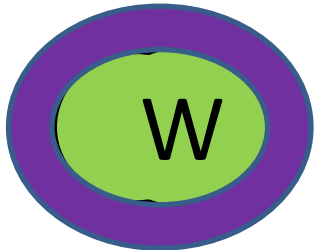
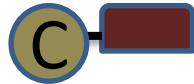
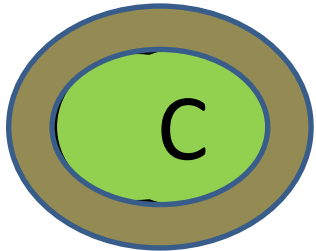
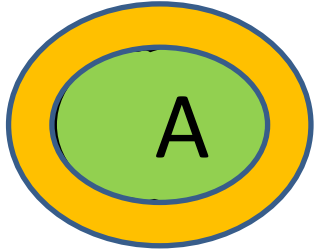
Men ACYW conjugate vaccine

Polysaccharide capsule Tetanus or CRM197



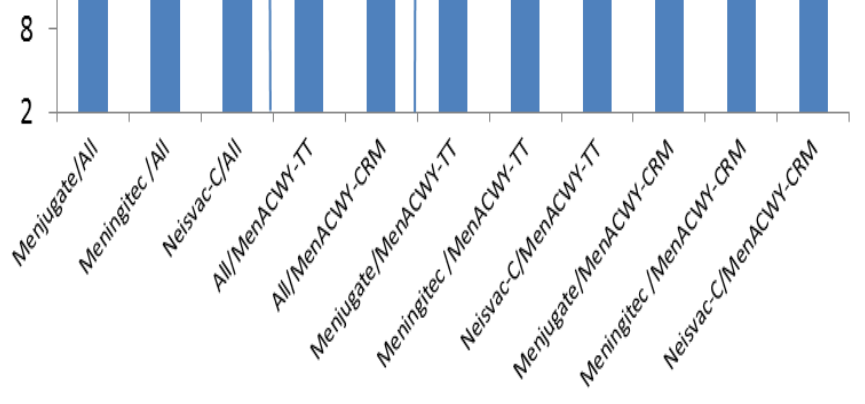
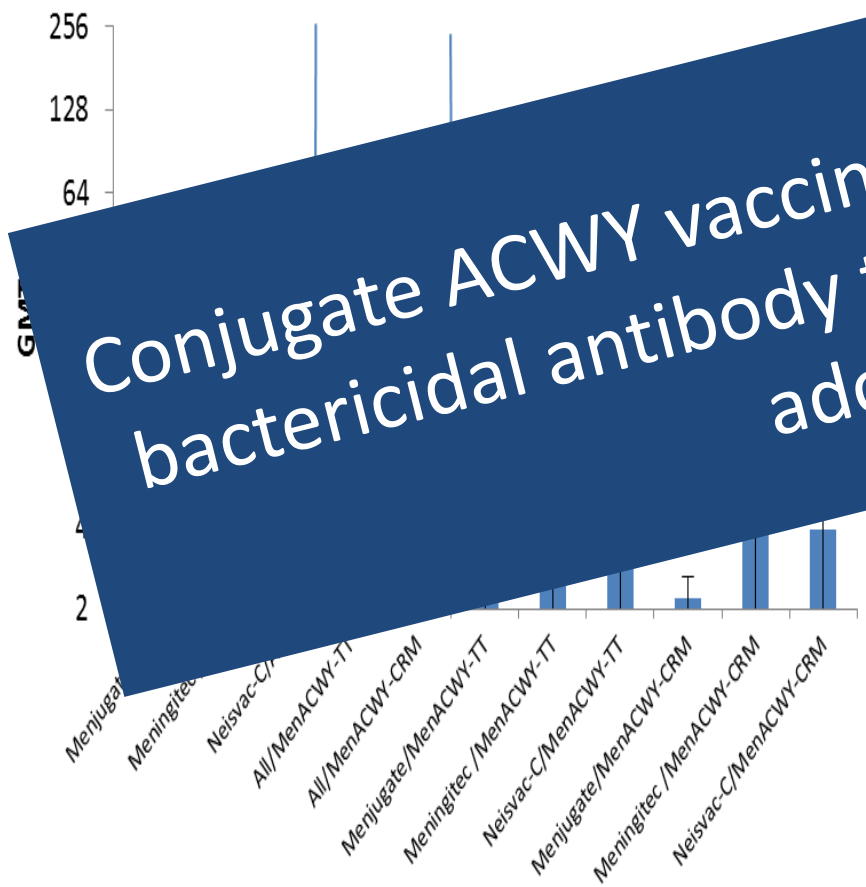
Men ACYW conjugate vaccine

Polysaccharide capsule Tetanus or CRM197



Capsular group-specific SBA GMTs, pre- and post-quadrivalent conjugate

Men W before booster



Conjugate ACWY vaccines induce very high serum bactericidal antibody titres after a single dose in adolescents



UK carriage study 15 to 17 year olds, before

Public Health England and after the introduction of serogroup C conjugate vaccine

















	1999 (BEFORE) N= 14064	2000 (AFTER) N=16583	RATIO 2000:1999
B	4.11	4.14	1.01
C	0.45	0.15	0.34
Y	0.97	1.05	1.09
W	1.12	1.42	1.27
NG/OTHER	10.05	11.22	1.12
TOTAL	16.7	17.98	1.08



Public Health England **JCVI recommendations: February 2015**

- Rapid increase in W cases, known virulence and international experience
 - JCVI; “a public health emergency”
- Optimal strategy difficult to decide based on wide age distribution
- Replace adolescent MenC doses with quadrivalent conjugate (ACWY)
 - Vaccination for school years 10-13 should have rapid impact on carriage and therefore have impact on disease in all age groups
 - Speed of effect will depend on speed of catch-up campaign

Changing the Meningococcal vaccine schedule – 2014-2017

	2 months	3 months	4 months	12 months	3.5 yrs	14 yrs
DT/IPV						
Hib						
PCV13						
Men C						



Serum bactericidal antibody killing of UK MenW cc11 strains by serum from infants immunised with Bexsero®

Lab number	Site	Type	Pre-	Pool1	Pool2	Pool3	Pool4 Post 4th
<p>This work suggests that children immunised with Bexsero may have some protection against the emerging strain of MenW (~70% Men W cases)</p>							>128
							64
							>64
							128
							>64
M11-240750	Blood	W:NTP1.5,2 cc11	<2	>64	>64	>64	>64
M12-240754	Blood	W:NTP1.5,2 cc11	<2	64	64	>64	>64

How will we implement the teenage MenACWY immunisation programme?



Public Health
England

Meningococcal ACWY programme

1. Urgent catch-up programme; August 2015
aged 17-18 years
2. First time university entrants; August 2015
up to 25 years
3. Routine cohort; September 2015
aged 13-15 years
4. Second catch-up cohort; January 2016
aged 15-16 years



UK meningococcal ACWY conjugate vaccine programme – planned roll-out

Public Health
England

Birth cohort	2014/15 year - age	Academic year				
		2014/15	2015/16	2016/17	2017/18	2018/19
01/09/2003-31/08/2004	Y6 – 10/11				Y9 ACWY	
01/09/2002-31/08/2003	Y7 - 11/12			Y9 ACWY		
01/09/2001-31/08/2002	Y8 - 12/13		Y9 ACWY			
01/09/2000-31/08/2001	Y9 - 13/14		Y10 ACWY			
01/09/1999-31/08/2000	Y10 - 14/15	Y10 MenC		Y12 ACWY		
01/09/1998-31/08/1999	Y11 - 15/16			Y13 ACWY		
01/09/1997-31/08/1998	Y12 - 16/17		Y13 ACWY			
01/09/1996-31/08/1997	Y13 – 17/18	Y13 ACWY				

Key:

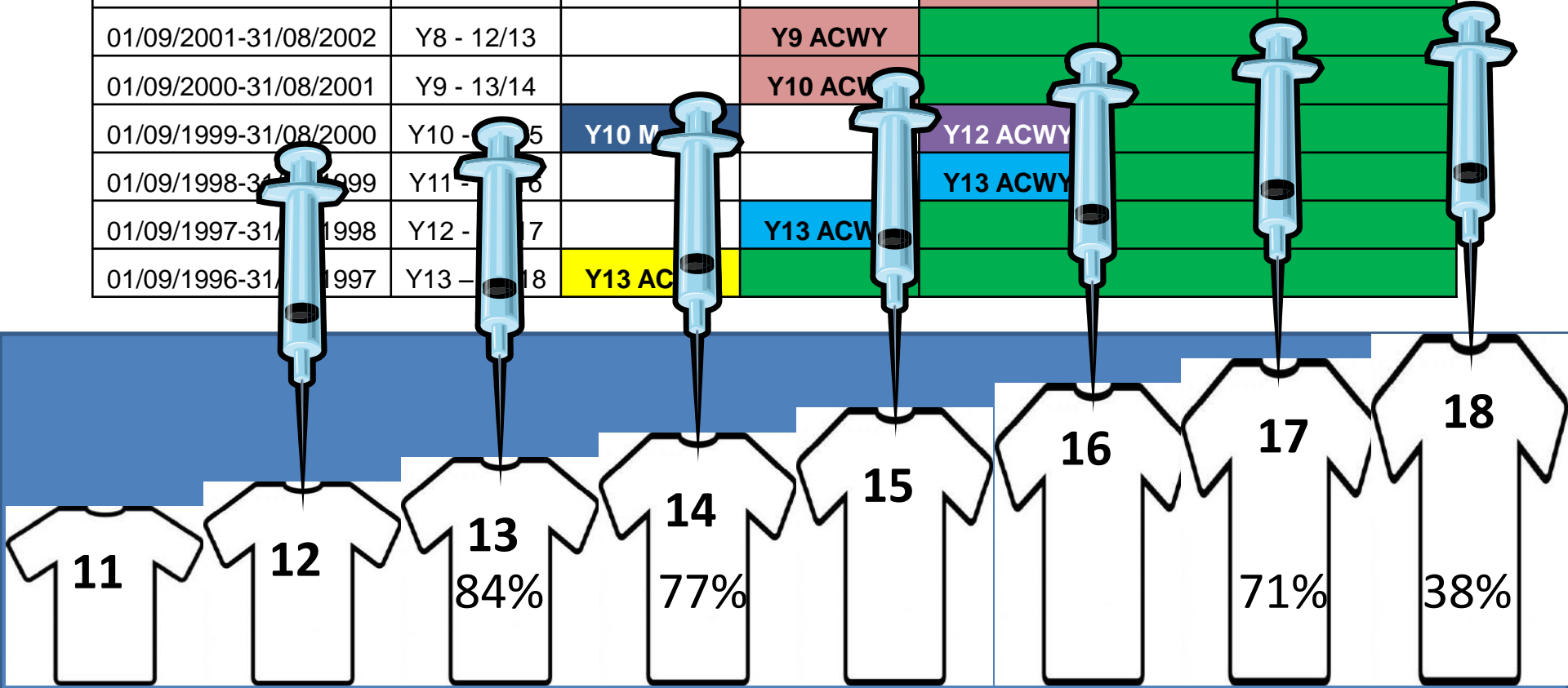
Routine schedule MenC
Routine schedule ACWY
School based catch-up ACWY
Primary care catch-up cohorts
Delivery mechanism to be decided
Completed



UK meningococcal ACWY conjugate vaccine programme – planned roll-out

Public Health
England

Birth cohort	2014/15 year - age	Academic year				
		2014/15	2015/16	2016/17	2017/18	2018/19
01/09/2003-31/08/2004	Y6 – 10/11				Y9 ACWY	
01/09/2002-31/08/2003	Y7 - 11/12			Y9 ACWY		
01/09/2001-31/08/2002	Y8 - 12/13		Y9 ACWY			
01/09/2000-31/08/2001	Y9 - 13/14		Y10 ACWY			
01/09/1999-31/08/2000	Y10 - 14/15	Y10 MCV		Y12 ACWY		
01/09/1998-31/08/1999	Y11 - 15/16			Y13 ACWY		
01/09/1997-31/08/1998	Y12 - 16/17		Y13 ACWY			
01/09/1996-31/08/1997	Y13 - 17/18	Y13 ACWY				



How will we monitor the vaccine programmes?



Monitoring meningococcal infection

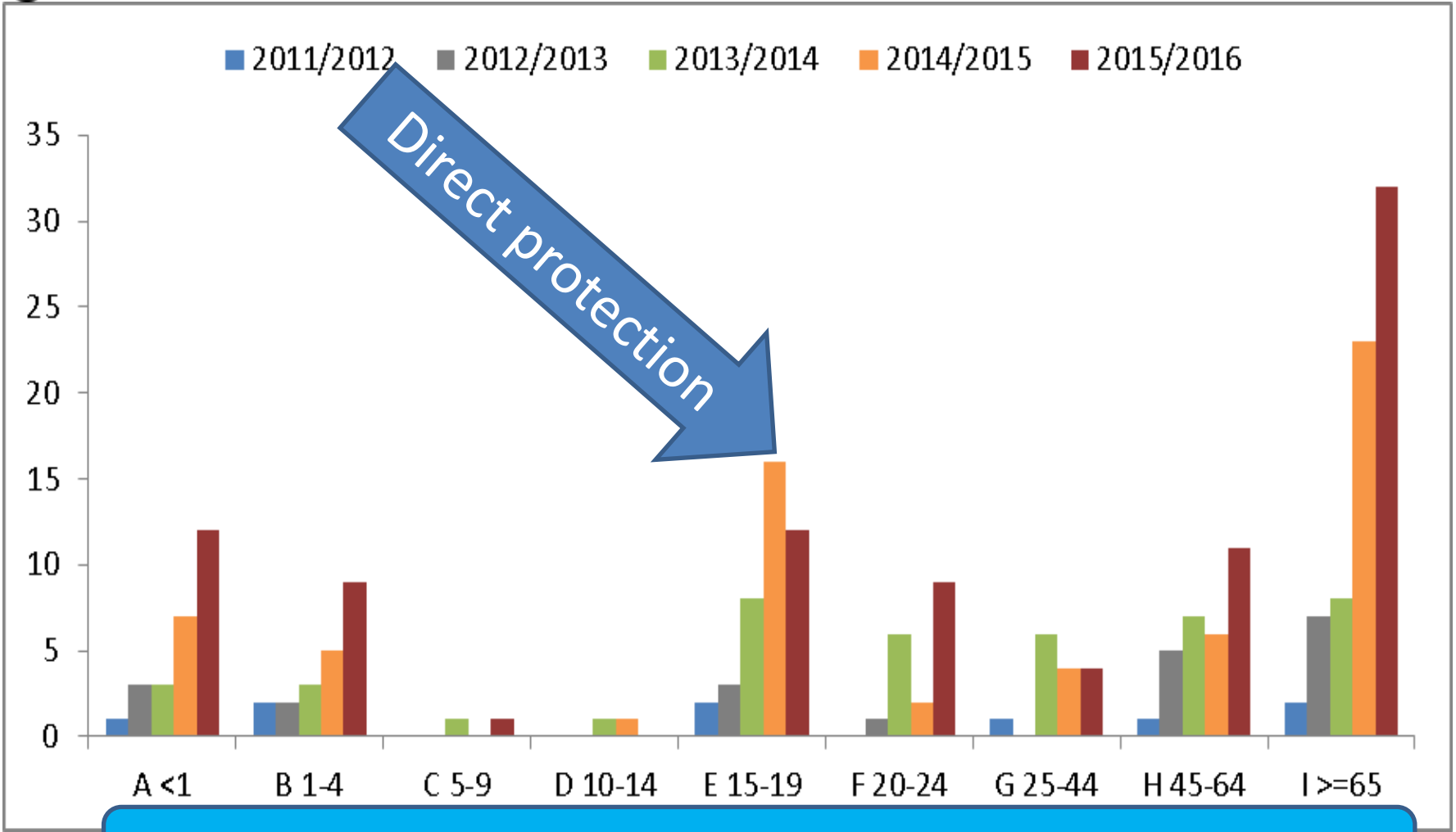
Public Health
England

- Notifications from clinicians and laboratories
- All cases followed up via local health protection unit – was child vaccinated?
- Samples to PHE meningococcal reference unit (MRU)
 - serogrouping, sero-sub typing
 - whole genome sequencing



Public Health
England

Confirmed serogroup W cases to 31 December, last 5 epi years by age group, England



?Indirect protection



Conclusions

Programs targeting young children give direct protection but time limited (antibody persistence poor).

Programs targeting adolescents/carriers can induce herd protection (antibody persistence good).

Serogroup W cases in the elderly, will they be covered by herd protection through immunising adolescents?