

Measles

Dr Mildred Iro MBBS MRCPCH PgDip (PID) DPhil AFHEA
Consultant in paediatric immunology and infectious diseases

Barts Health NHS Trust

15/02/2024

The child with altered behaviour

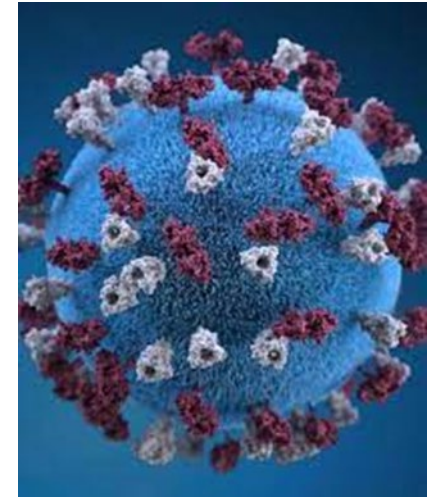
- 7 year old
- Head drifting to one side and loss of balance
- Abnormal behaviour, screaming outbursts
- Normally fit and well and fully functioning child prior to symptom onset
- Up to date with immunisations
- Normal examination, baseline investigations performed
- Outpatient follow up planned

Clinic appointment 6 weeks later

- Significant behavioural change
 - Increased frequency of head drops
 - Recurrent falls, limited mobility, unsteady on feet, erratic behaviour, unable to focus, screaming ++
- Seizures (EEG)
- Rapidly progressing white matter changes (brain MRI)
- Evidence of intrathecal antibody production against measles
- Diagnosis of subacute sclerosing panencephalitis (SSPE)
- Rapid decline to vegetative state
- Viral illness with conjunctivitis prior to MMR

What is measles

- Highly contagious (R_0 12-18)
- Single stranded RNA virus
- Droplets or air spread
- Significant mortality burden
 - 128,000 deaths in 2021 (WHO) – mostly under vaccinated or unvaccinated children <5 years
 - High income versus low income countries: 1:5000 versus 1:100



Clinical features

- Incubation period: 7 - 21 days (av. 10-12 days)
- Infectivity period: 1 - 4 days before to 4 - 5 days after rash
- Clinical features:
 - 3C's (coryza, conjunctivitis, cough)
 - Koplik spots
 - rash
 - irritability
 - fever
 - malaise





Measles - complications

- **Common**

- Otitis media (7-9%)
- Pneumonia (1-6%)
- Diarrhoea (8%)
- Convulsion (0.5%)

- **Rare**

- Acute encephalitis (1-4 per 1000-2000 cases of measles)
- SSPE: 1:25000 and 1:8000 (16x higher in infants)
- Myocarditis
- Thrombocytopenic purpura

MMR vaccination

- Measles (1963, 1968), mumps (1967), Rubella (1969), MMR (1971)
- Live vaccine: Priorix[®] and M-M-RVaxPRO[®] (gelatine/porcine derivative)
- UK: 2 doses (12 months; 3 years 4 months); can be given before 1st birthday (outbreak/travel)
- Recent JCVI recommendation (2nd dose at 18 months)
- Contraindications
 - immunosuppressed
 - confirmed anaphylactic reaction to a previous dose of a measles, mumps, or rubella-containing vaccine
 - confirmed anaphylactic reaction to neomycin or gelatine
 - pregnancy, as a precaution

MMR efficacy

- Primary infection prevention
 - Measles: Single dose (95%), two doses (96%)
 - Two dose MMR : mumps (86%), rubella (89%)
 - 20 million measles cases and 4,500 deaths prevented (UK)
 - 1.4 million cases of rubella prevented and 1,300 cases of birth defects and averted 25,000 terminations (UK)
- Prevention of transmission: 81% (1 dose), 85% (2 doses) and 96% (3 doses)
- Post exposure prophylaxis (at least one dose) - 74% (measles)

MMR vaccine impact

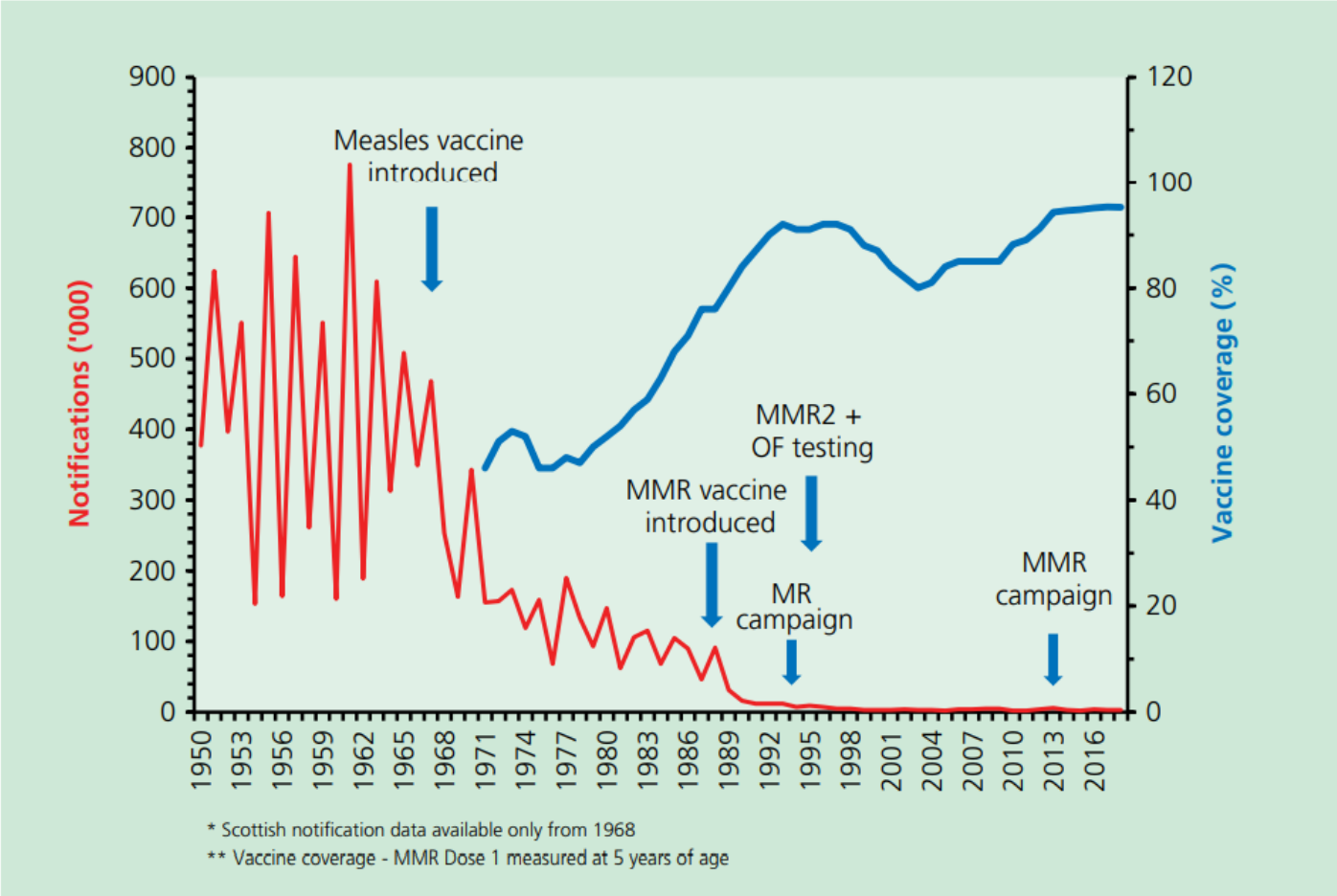
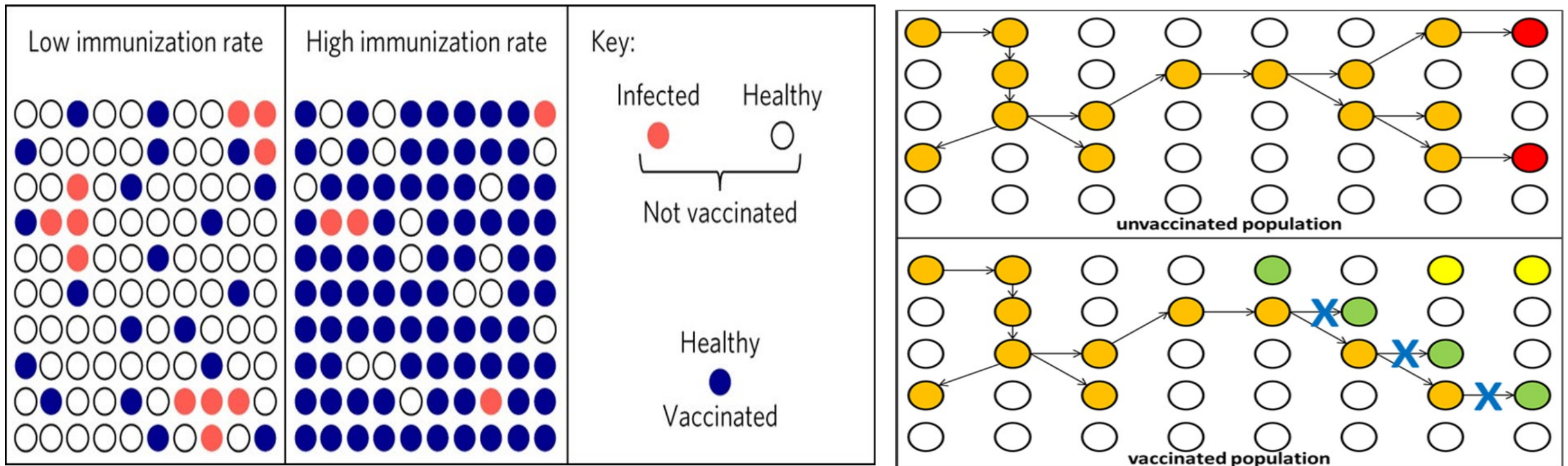


Figure 21.1 Coverage of measles vaccination and measles notifications from 1950 to 2018

Herd immunity



Herd immunity against measles requires **95%** of the population to be vaccinated

> 3.4 million children under the age of 16 are not fully vaccinated with the MMR (NHS figures)

MMR vaccine side effects

- Very common: redness, fever, URTI, irritability, measles like rash (1:10)
- Aseptic meningitis (Urabe mumps strain, no longer used in UK)
- Parotid swelling (1%), usually in 3rd week
- Febrile seizures (1:700-1:1150 administered doses)
- Arthralgia/arthritis (14-21 days)
- MMR induced ITP (1:22300), within 6 weeks

Myths

- Increased risk of autism
- Guillain Barre syndrome
- Gait disturbance
- Inflammatory bowel disease
- Epilepsy following febrile convulsion



Summary

- Measles is highly contagious, significant burden
- Think measles if unvaccinated child with febrile illness and rash
- MMR vaccination is effective but.....
- High level of population immunity is needed

References

- Di Pietrantonj C, Rivetti A, Marchione P, Debalini MG, Demicheli V. Vaccines for measles, mumps, rubella, and varicella in children. Cochrane Database of Systematic Reviews 2020, Issue 4. Art. No.: CD004407.
- The Green Book, Chapter 21: Measles
- Vaccine Knowledge (Oxford Vaccine Group):
<https://vaccineknowledge.ox.ac.uk/mmr-vaccine#More-information-about-the-vaccine>