

## Questions about the Ebola vaccine

- What trial design did they use (which had never been used before)?
- Did they have a control group?
- Did they finish their intended trial? Why or why not?
- Were you convinced by the data they presented?
- What two reasons make the vaccine “first generation”?
- Was the vaccine developed privately or publically? And what about the trial?

## Different Ebola vaccines use different trial types

VACCINES/LOCATION	TARGET ENROLLMENT	START DATE	DESIGN	STATUS
Merck, GSK/Liberia	27,000 in general population	February 2015	Randomized controlled with placebo arm	Stopped at 1500. Blood collection continues
Merck/Sierra Leone	8700+ front-line workers	April 2015	Immediate versus deferred	Immediate arm vaccinated, deferred in fall
Merck/Guinea	190 clusters of potential contacts	April 2015	Ring vaccination, immediate versus deferred	Control arm halted after analysis of first 90 clusters, all offered vaccine
Merck/Guinea	1200 frontline workers	March 2015	Safety and immune responses	May add 2000 more
GSK/Mali, Senegal, Ghana, Cameroon, Nigeria	3000 adults	June 2015	Safety and immune responses	Plan to add 600 children in October

- Do either Merck or GSK have an FDA approved vaccine now? Why or why not?

## Vaccines currently recommended at check-ups for 2-month olds

- Diphtheria, tetanus, and pertussis (whooping cough)
- Polio
- Hepatitis B
- Bacterial pneumonia and meningitis
- HiB (another type of meningitis)
- Rotavirus (a severe form of diarrhea)

## Vaccination is a major public health issue

- **Rates of vaccination are falling**
- Some viruses are very hard to develop vaccines against, because those viruses are constantly changing their genomes (e.g. HIV)

## The Wakefield paper in The Lancet

- The paper was retracted, due to fraudulent studies, and conflicts of interest
- Wakefield's medical license was revoked
- Many follow-up studies have shown no link
- Measles became endemic in England, after being eliminated decades before



<http://sphweb.bumc.bu.edu/ottr/MPH-Modules/PH/Autism/WakefieldPaperRetractedsm.png>  
<http://www.cnn.com/2011/HEALTH/01/05/autism.vaccines/t1larg.andrew.wakefield.gj.jpg>

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## “How Vaccine Fears Fueled the Resurgence of Preventable Diseases”

- Vaccination rates dropped in Europe after 1998 from 90+% to < 80% (lower than the threshold for “herd immunity”)
- France had a massive measles outbreak in 2011 (larger than all countries other than India, Indonesia, Congo, Somalia, Nigeria)
- In London, measles vaccination rates dropped to 73%
- Britain now conducts public polling to identify regions where confidence in vaccines is waning



An interactive map of outbreaks:  
**Michaeleen Doucleff, npr.org, 1/25/2014**  
<http://www.npr.org/blogs/health/2014/01/25/265750719/how-vaccine-fears-fueled-the-resurgence-of-preventable-diseases>  
<http://www.wales.nhs.uk/sitesplus/gallery/888/measles%20rash.png>

## How Vaccine Fears Fueled the Resurgence of Preventable Diseases Michaeleen Doucleff, npr.org, 1/25/2014

- An interactive map from the Council on Foreign Relations
- One dot is one outbreak; the size of the dot is the number of people infected
- The dots in Africa are due to lack of availability of vaccines

<http://www.npr.org/blogs/health/2014/01/25/265750719/how-vaccine-fears-fueled-the-resurgence-of-preventable-diseases>

## Common concerns among parents

- Some don't think their children could get diseases “of the past”
- Some don't think many vaccine-preventable diseases are very serious
- Some are worried that vaccines aren't safe, either in:
  - The short term (e.g. getting the disease from the vaccine, overloading the immune system, effects of toxic additives)
  - The long term (e.g. autism, MS, diabetes)

## The current situation in the US

- More than 1 in 10 US parents have refused at least one recommended vaccine
- 1 in 4 US parents still believe vaccines can cause autism in healthy children
- A 20min check-up at 2 months does not provide enough time for concerns
- In 2012, the US had its highest # of whooping cough cases in 50 years
- In 2014, the US had its highest # of measles cases since “elimination” of the disease in 2000

## The “Perception Gap”, by David Ropeik

- The existence of scientific information is not enough to affect the general public
- It is important to make information available, understandable, effective, and accurate
- It is important for messaging to go beyond that, by understanding, respecting, anticipating, and directly addressing common concerns

“The Perception Gap” by David Ropeik, Feb 3<sup>rd</sup> 2011 guest blog entry at [Scientific American](#)

## Questions for discussion

- Which contingents (e.g. government, media, doctors, scientists, educators, celebrities, etc) do you feel impacted the recent decrease in vaccination rates, and how did they do so?