The Role of Vaccines In Preventing Antimicrobial Resistance

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News

Vaccines are a critical weapon in the fight against superbugs

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6 MARCH 2019 • 9:46AM

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A nurse takes a patient's temperature during last summer's cholera and typhoid outbreak in Zimbabwe CREDIT: JEKESAI NJIKIZANA/AFP

The Telegraph

January 2019
Up to £1m funding awarded to develop bacterial vaccines in global fight against antimicrobial resistance

26TH FEBRUARY 2019
Vaccines for AMR panel discussion event

Vaccines to tackle drug resistant infections

An evaluation of R&D opportunities

wellcome

BCG

The Boston Consulting Group

Vaccine-Injury Stories | Vaccine Injury 101 | Vaccine Injury 202 | Parents Speak Out | Resources

vaccine-injury.info

AN INJURY TO ONE IS AN INJURY TO ALL

No vaccine has ever been tested for carcinogenicity (causing cancer) mutigenicity (damaging DNA) or impairment of fertility (fetal harm).

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Brain Damage/Death from Vaccines is NOT Rare

VaxXed Stories: The McDowell Triplets in Michigan (pneumococcal)

Dr James Meehan MD at TxMFA

Fetal Death | Medical Billing Records

Dr Bob Zajac

VaxXed Tour: Brave Dr. Moss in West Virginia

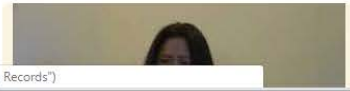
Vaccine Autism Debate - Except When They Do - SafeMinds

Are vaccines to blame for infant deaths?

Dan Burton Questions FDA Rep

Are Vaccinations Safe for Your Kids? CBN report Dr. Blaylock.

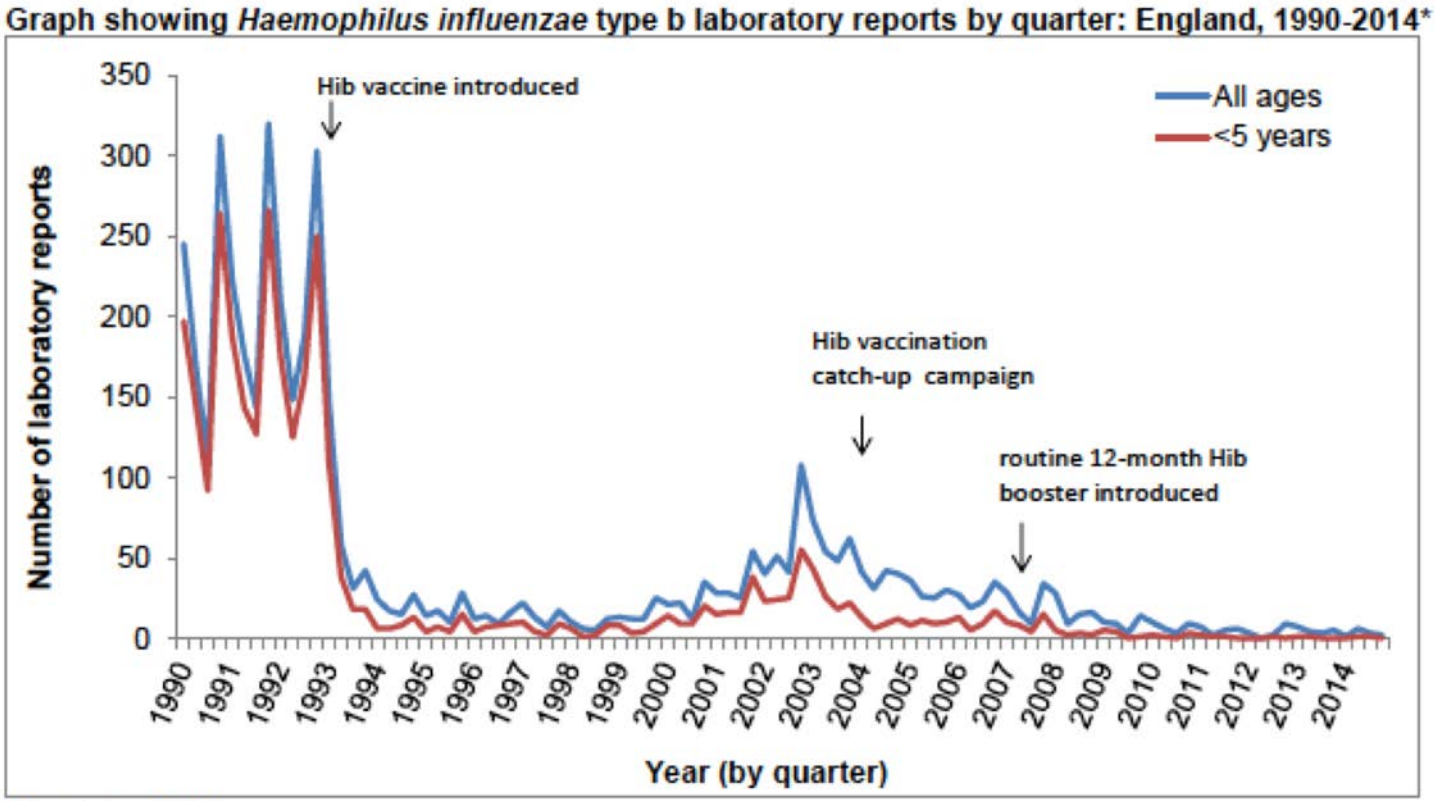
Vaccine's Safety: A Crime Against Humanity



javascript:writeEmbedCode("gt3kFxFRo-w","Fetal Death | Medical Billing Records")

Why has antibiotic use and resistance increased despite the use of vaccines?

Reducing Resistance



https://www.gov.uk/government/publications/haemophilus-influenzae-epidemiological-data

July 15, 1974

More

Haemophilus influenzae Type B Resistant to Ampicillin

A Report of Two Cases

Waheed Khan, MS; Sydney Ross, MD; William Rodriguez, MD; et al

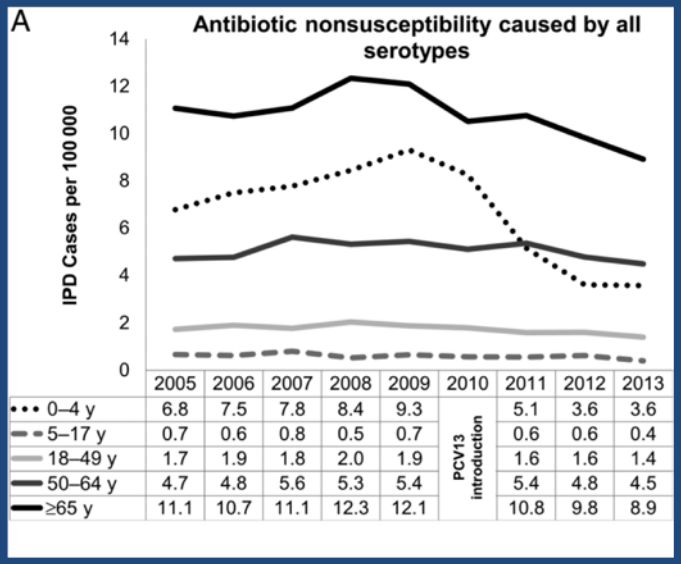
JAMA. 1974;229(3):298-301. doi:10.1001/jama.1974.03230410022016

Full Text

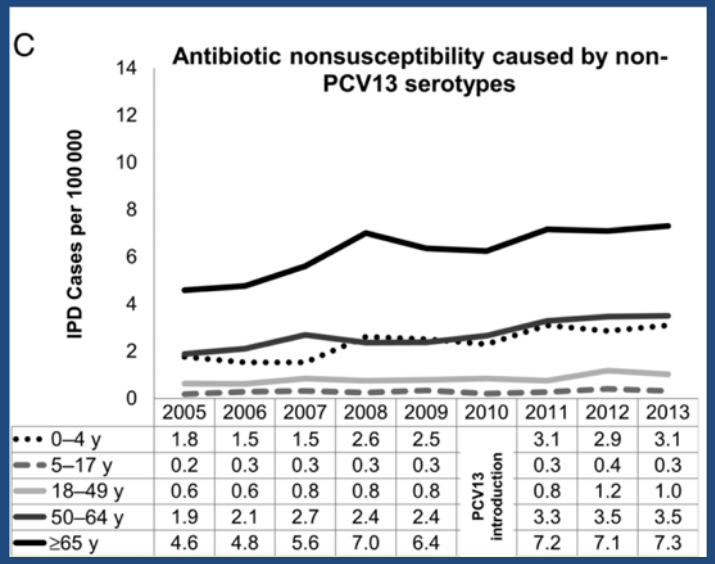
Abstract

Recently, two infants with severe infections due to ampicillin-resistant strains of *Haemophilus influenzae* type B were treated at Children's Hospital National Medical Center. In both cases, it was necessary to change therapy to chloramphenicol. One patient with meningitis died while the second with bacteremia and pneumonia recovered. A survey of 60 recent isolates of *H influenzae* type B in the Washington community showed that 10% were ampicillin-resistant. The enzyme produced by these resistant strains was found to be a β-lactamase. Careful appraisal is now necessary to decide whether ampicillin is the drug of choice as initial therapy in *H influenzae* meningitis in pediatric patients.

(*JAMA* 229:298-301, 1974)



	2005	2006	2007	2008	2009	2010	2011	2012	2013
0–4 y	6.8	7.5	7.8	8.4	9.3		5.1	3.6	3.6
5–17 y	0.7	0.6	0.8	0.5	0.7		0.6	0.6	0.4
18–49 y	1.7	1.9	1.8	2.0	1.9		1.6	1.6	1.4
50–64 y	4.7	4.8	5.6	5.3	5.4		5.4	4.8	4.5
≥65 y	11.1	10.7	11.1	12.3	12.1		10.8	9.8	8.9



	2005	2006	2007	2008	2009	2010	2011	2012	2013
0–4 y	1.8	1.5	1.5	2.6	2.5		3.1	2.9	3.1
5–17 y	0.2	0.3	0.3	0.3	0.3		0.3	0.4	0.3
18–49 y	0.6	0.6	0.8	0.8	0.8		0.8	1.2	1.0
50–64 y	1.9	2.1	2.7	2.4	2.4		3.3	3.5	3.5
≥65 y	4.6	4.8	5.6	7.0	6.4		7.2	7.1	7.3

Overall decrease in antibiotic non-susceptible serotypes

Clinical Infectious Diseases, Volume 62, Issue 9, 07 February 2016, Pages 1119–1125, https://doi.org/10.1093/cid/ciw067

Reducing Antibiotic Use

Pneumococcal Conjugate Vaccine

35 antibiotic prescriptions per 100 vaccinated children prevented

1.4 million antibiotic prescriptions prevented in the US

Fireman B, Black SB, Shinefield HR, Lee J, Lewis E, Ray P. Impact of the pneumococcal conjugate vaccine on otitis media. Pediatr Infect Dis J 2003; 22: 10–16

Lee et al Outpatient antibiotic prescribing in the United States: 2000 to 2010 *BMC Medicine*2014**12**:96

Universal Influenza vaccination

64% decrease in antibiotic prescribing for influenza associated infections compared to other provinces

~144 000 antibiotic prescriptions prevented

Kwong et al The Effect of Universal Influenza Immunization on Antibiotic Prescriptions: An Ecological Study *Clinical Infectious Diseases* 2009; 49(5):750–756

Universal Influenza vaccination

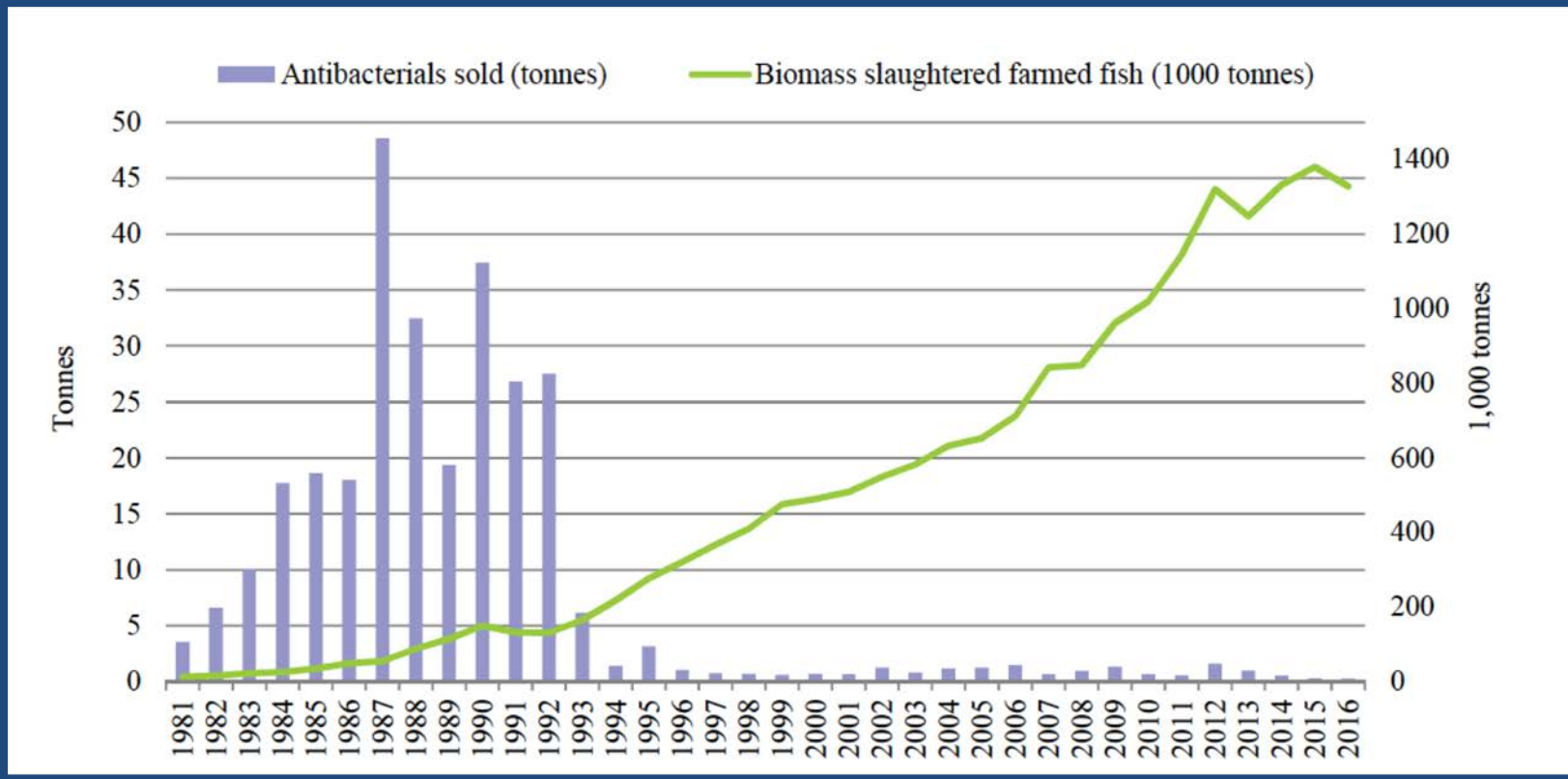
Reducing secondary bacterial complications

Reducing inappropriate prescribing

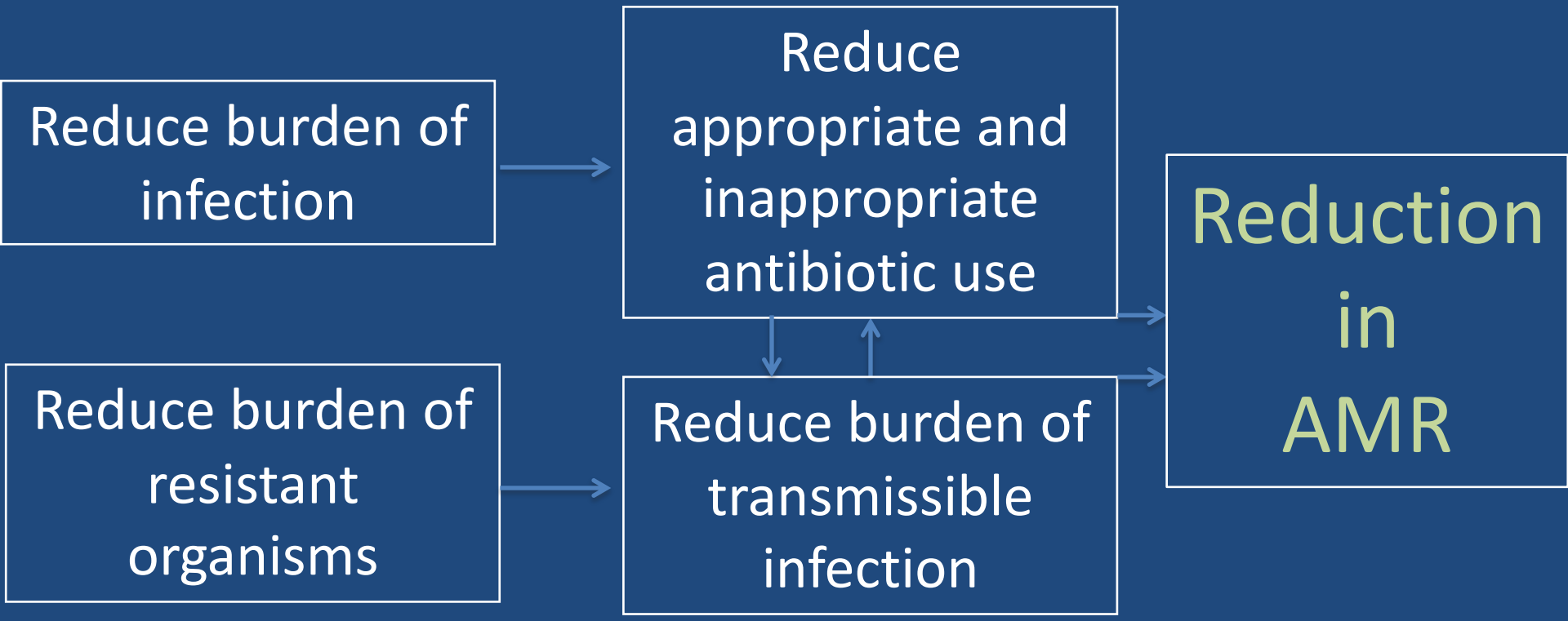
Havers HP et al Outpatient Antibiotic Prescribing for Acute Respiratory Infections During Influenza Seasons JAMA Netw Open 2018 1;1(2):e180243

Hardelid P et al. **Effectiveness of live attenuated influenza vaccine in preventing amoxicillin prescribing in preschool children: a self-controlled case series study Antimicrob Chemother** 2018 Mar 1;73(3):779-786.

Norwegian Salmon Farming



NORM NORM 2016


Reduce burden of infection
Reduce appropriate and inappropriate antibiotic use
Reduction in AMR
Reduce burden of resistant organisms
Reduce burden of transmissible infection

Reduce the Burden of Infection

Reduce the Burden of Infection

Antigen	Optimisation
Pneumococcus	Increase serotype coverage, whole cell vaccine Older adults – improve effectiveness
Influenza	Universal vaccine
Pertussis	Improved duration – recombinant vaccines
Men B	Improve breadth of serotype coverage
HPV	Serotype coverage

Optimise vaccines that are currently in use

Reduce the Burden of Infection

Group A Strep

S.aureus

E.coli

Reduce the Burden of Infection

Group A Strep

S.aureus

E.coli

TB

Malaria

HIV

Reduce the Burden of Resistant Organisms

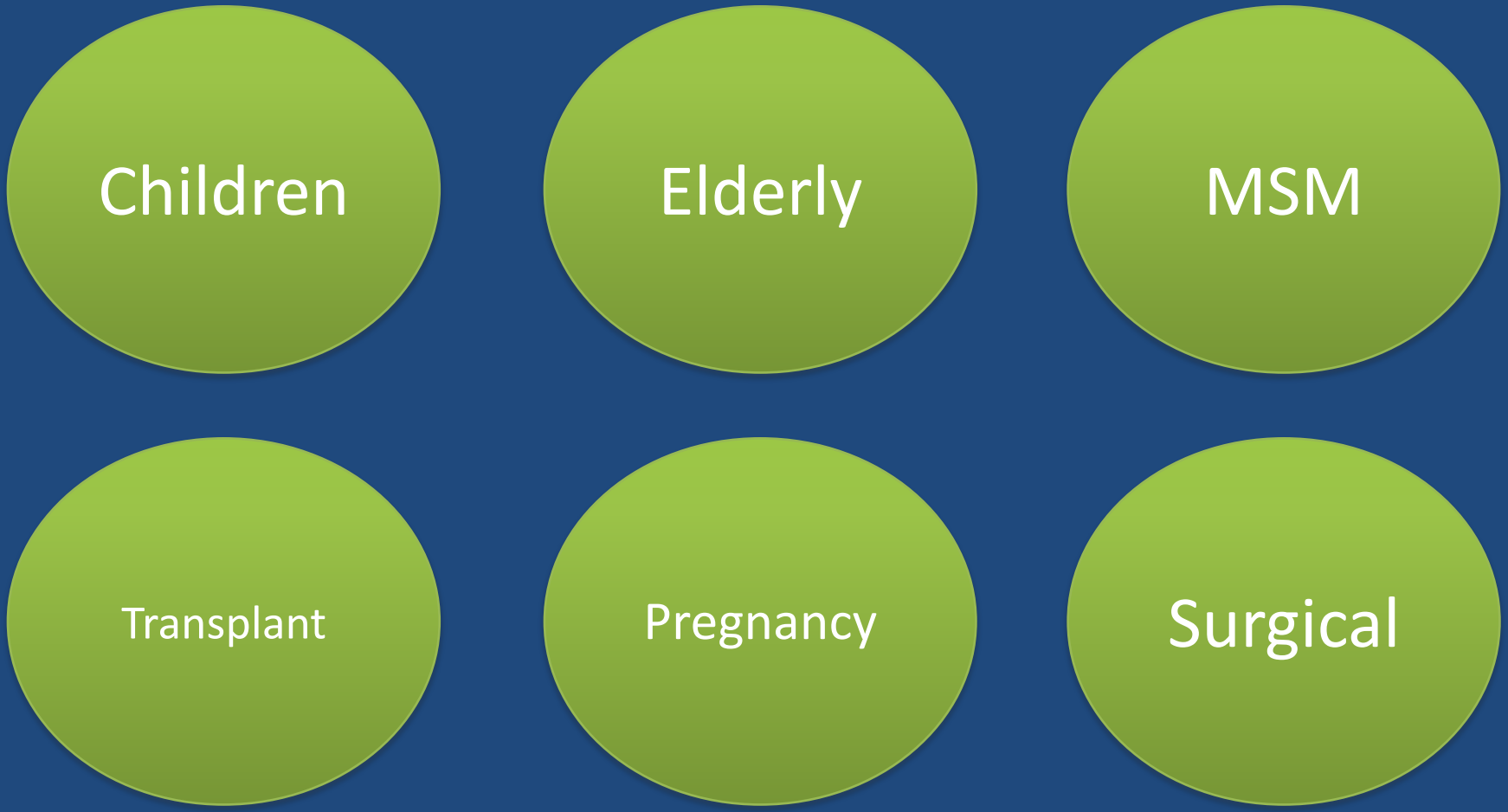
Gonococcus

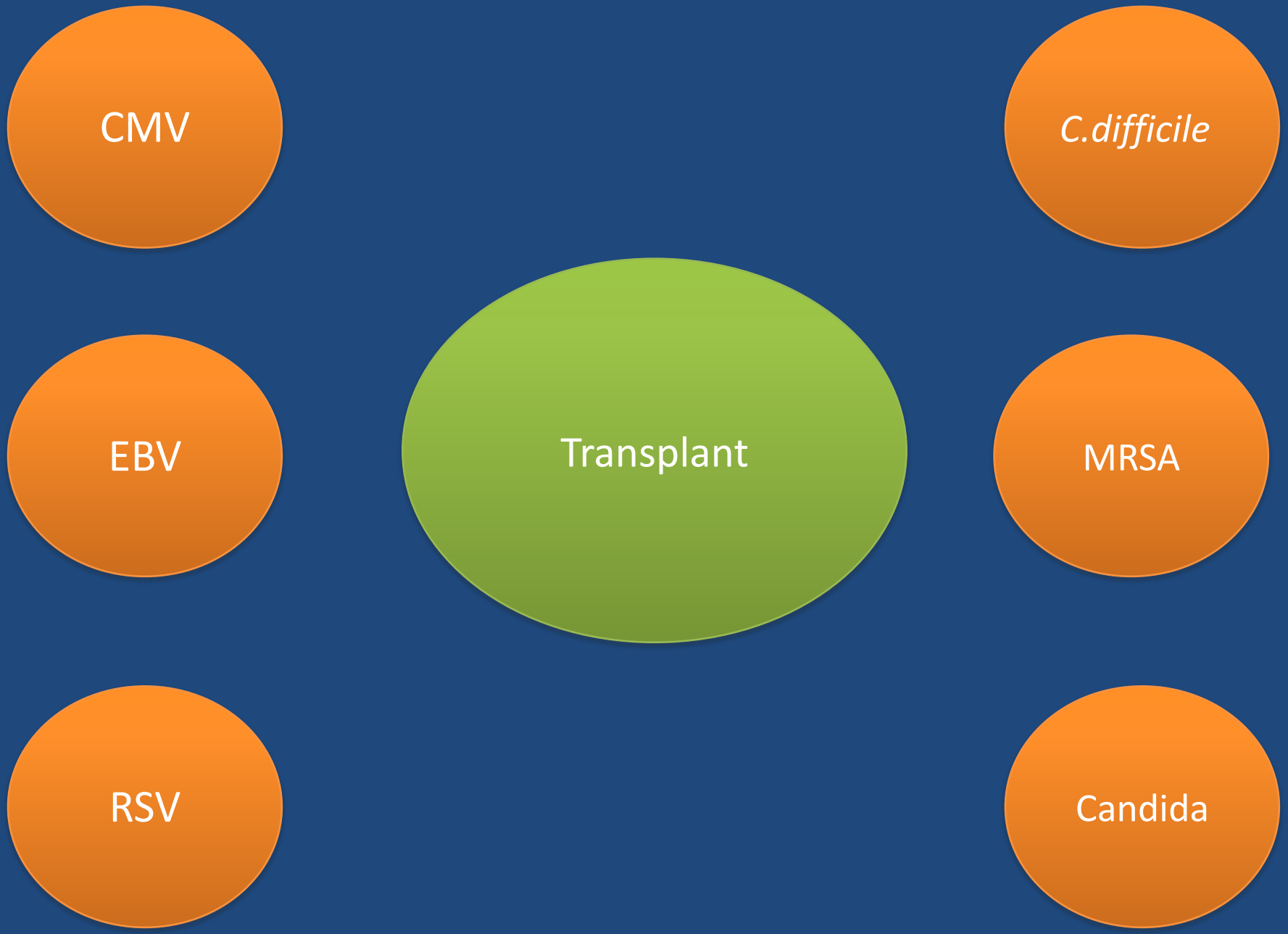
CPE

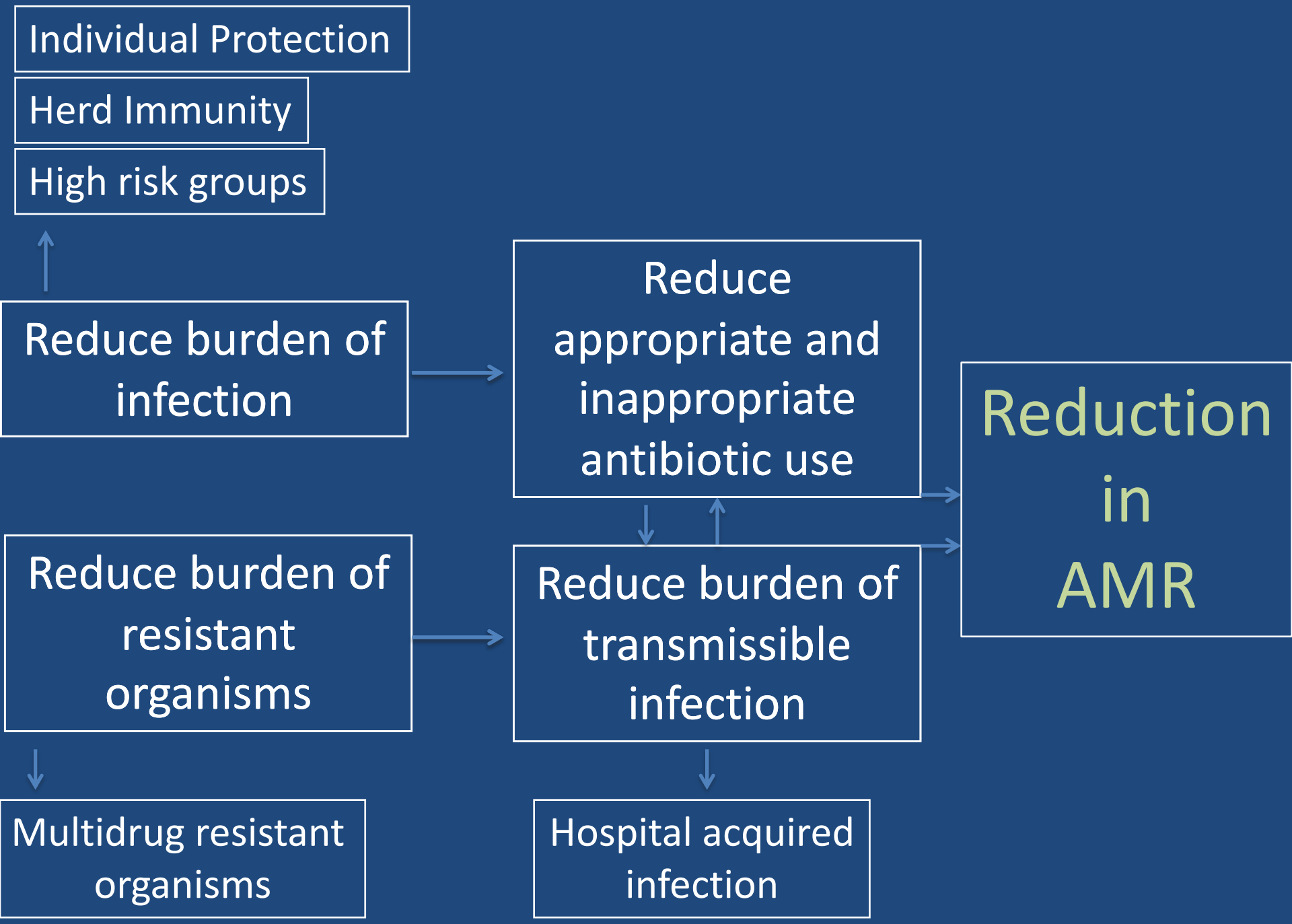
Salmonella

High Risk Populations

High Risk Populations




CMV
C.difficile
EBV
Transplant
MRSA
RSV
Candida


Individual Protection
Herd Immunity
High risk groups
Reduce burden of infection
Reduce appropriate and inappropriate antibiotic use
Reduction in AMR
Reduce burden of resistant organisms
Reduce burden of transmissible infection
Multidrug resistant organisms
Hospital acquired infection

Vaccine Uptake

rage Statistics

Local Authority Coverage Time Series

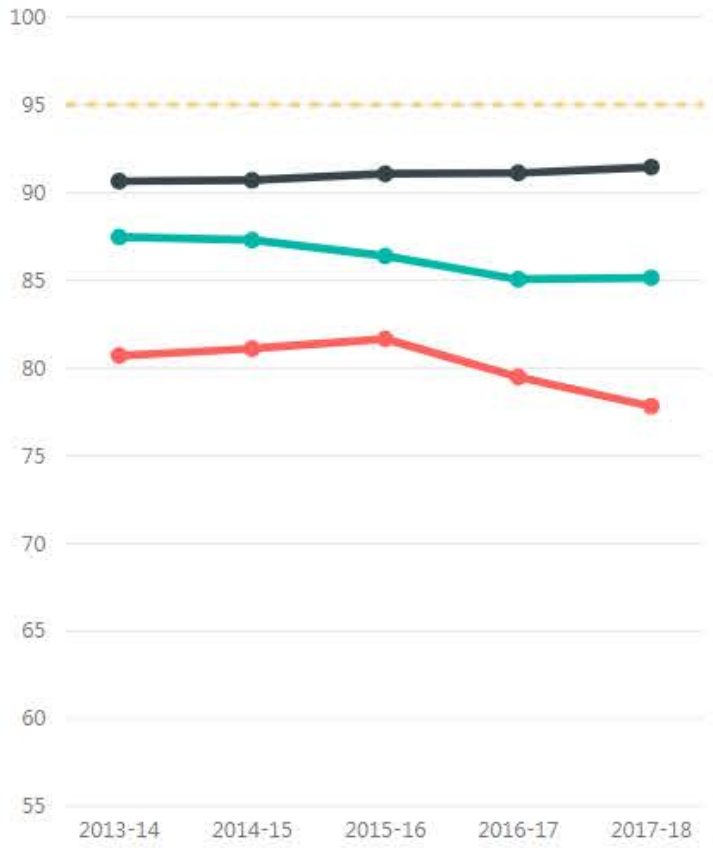
NHS Digital

Earliest Year	Latest Year	Years Shown
2013-14	2017-18	5

Region

London

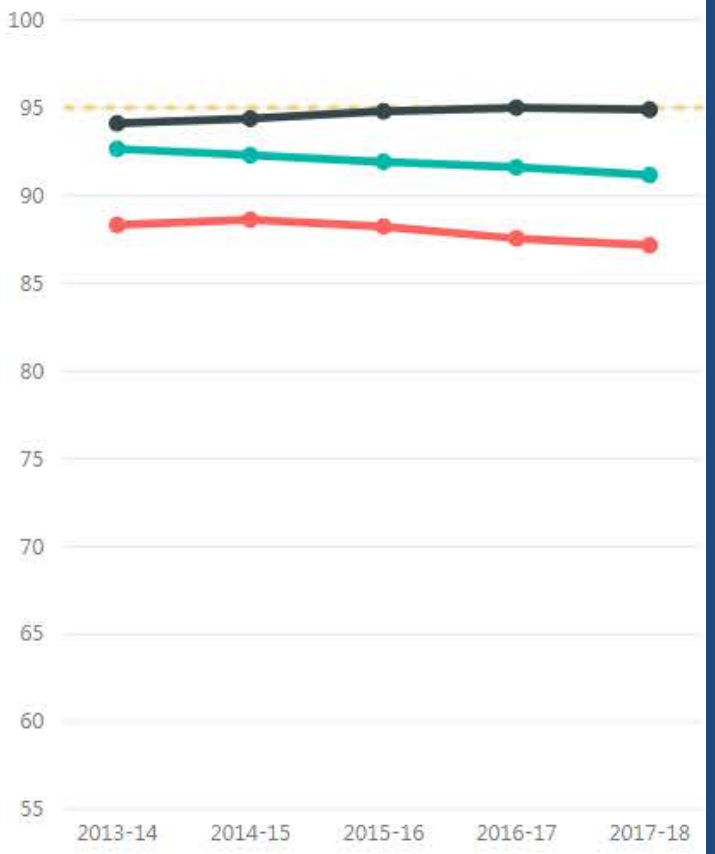
Region coverage (%)



Country

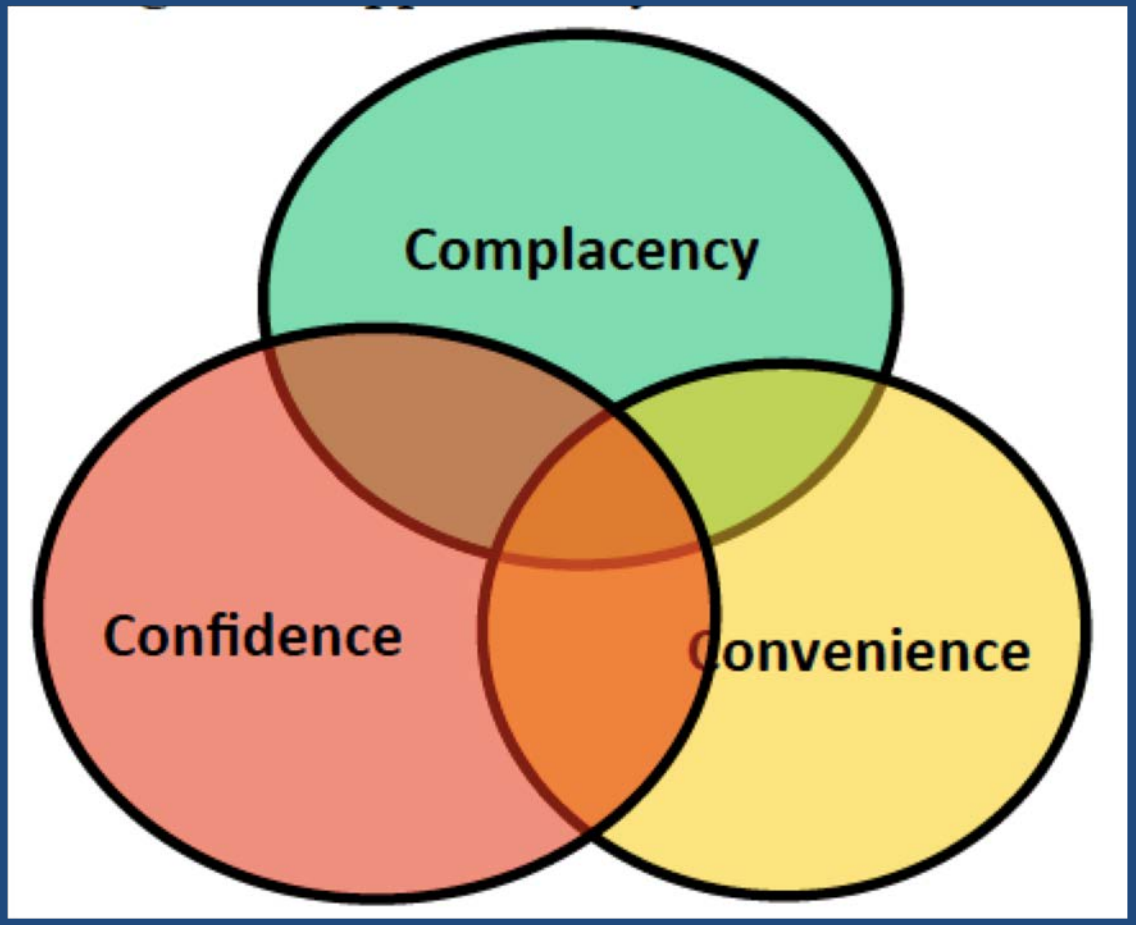
England

Country coverage (%)



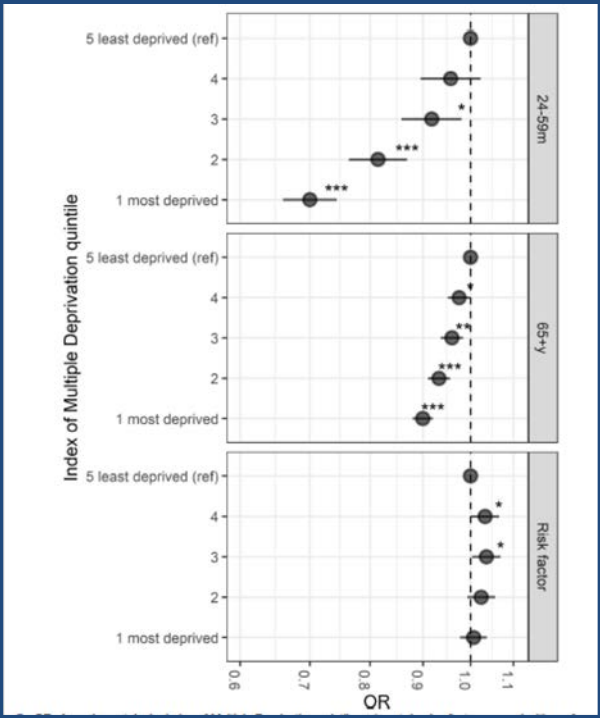
MMR1 at 24m MMR1 at 5y MMR2 at 5y

Vaccine Hesitancy



Socioeconomic Factors

Influenza vaccine Merseyside



Hungerford, D., Ibarz-Pavon, A., Cleary, P., & French, N. (2018). Influenza-associated hospitalisation, vaccine uptake and socioeconomic deprivation in an English city region: an ecological study. *BMJ open*, *8*(12), e023275. doi:10.1136/bmjopen-2018-023275

HPV vaccine in South West

Univariable and multivariable model of predictors of initiation of HPV vaccination course

Covariate	*N*	*Unadjusted*			*Adjusted*		
		OR	*95% CI*	*P value*	*OR*	*95% CI*	*P value*
Ethnicity							
White British[a]	11 070	1.00	—	—	1.00	—	—
Mixed ethnicity	143	0.78	(0.46–1.32)	0.35	0.94	(0.55–1.61)	0.84
Asian or British Asian	335	0.43	(0.33–0.57)	<0.001	0.59	(0.44–0.80)	0.001
Black or British Black	122	0.33	(0.22–0.51)	<0.001	0.50	(0.32–0.79)	0.003
Chinese and other	179	0.36	(0.25–0.53)	<0.001	0.48	(0.33–0.71)	<0.001
Not stated	2433	0.39	(0.35–0.44)	<0.001	0.44	(0.39–0.50)	<0.001
				<0.001[b]			**<0.001**[b]

Harriet Fisher, Suzanne Audrey, Julie A. Mytton, Matthew Hickman, Caroline Trotter; Examining inequalities in the uptake of the school-based HPV vaccination programme in England: a retrospective cohort study, Journal of Public Health, Volume 36, Issue 1, 1 March 2014, Pages 36–45

Routine Vaccination Practice after Adult and Paediatric Allogeneic and Haematopoietic Stem Cell Transplant

- minority of adult (8%) and paediatric (10%) programmes offer 77 vaccination on site

- Nearly two-thirds (65%) of programmes do not maintain a record of vaccine administration in patients' case notes

- Variation in vaccination time points and vaccinations given

Miller PDE et al Routine vaccination practice after adult and paediatric allogeneic haematopoietic stem cell transplant: a survey of UK NHS programmes
Bone Marrow Transplantation **volume 52**, page 1082 (2017)

Conclusions

Vaccines prevent AMR by multiple mechanisms. In order to use vaccines to their full potential we need to optimise current use and support vaccine development.

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ONLINE COURSE

The Role of Vaccines in Preventing Infectious Diseases and Antimicrobial Resistance

BRITISH SOCIETY FOR ANTIMICROBIAL CHEMOTHERAPY

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Support

UK CLINICAL VACCINE NETWORK

#CVNUK19

The UK Clinical Vaccine Network exists to bring updates in vaccinology to clinicians and offer opportunities for clinicians to get involved in vaccine development

BRITISH SOCIETY FOR ANTIMICROBIAL CHEMOTHERAPY

Welcome

This online forum is free to join and enables all involved in vaccine development and vaccine use the opportunity to

UK CLINICAL VACCINE NETWORK

#CVNUK19

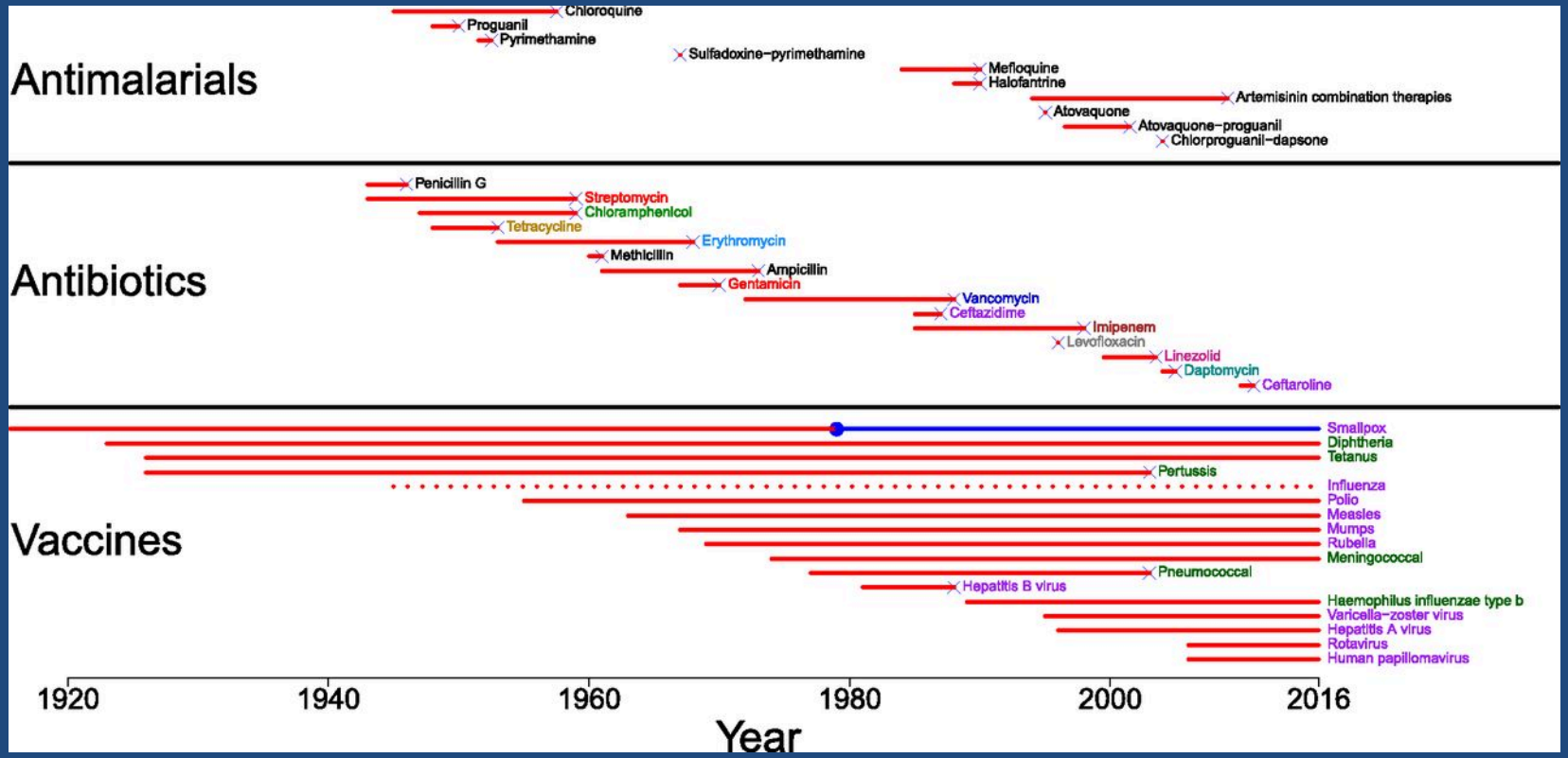
UK Clinical Vaccine Network Conference 2019

14th June
Oxford

REGISTER NOW

Welcome to the UK Clinical Vaccine Network Conference 2019, a single day conference focusing on the future direction and challenges within the vaccine arena, and set to be the go-to annual conference

Time between deployment of an intervention and the first documented failure in humans due to resistance (marked with “x”s).



David A. Kennedy, and Andrew F. Read PNAS
2018;115:51:12878-12886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POLIO
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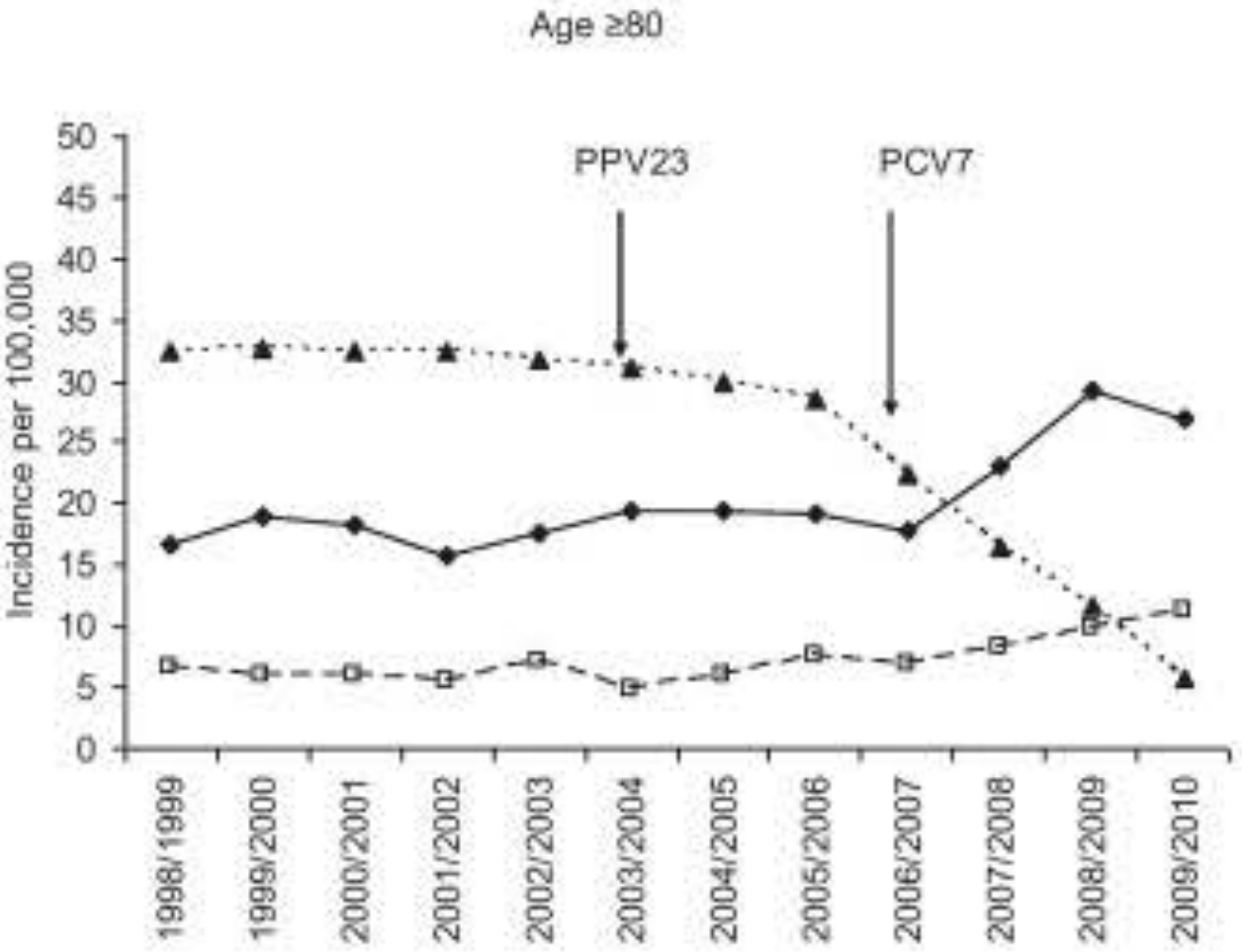
MUSCOGEE


Do you need the flu jab?
Asthma?
Heart disease?
Diabetes?
Weakened immune system?
Liver disease?
Lung disease?
Kidney disease?
FLU FACT
You need a flu jab every year
If you have any of these conditions, you are also more likely to develop serious complications from flu, such as pneumonia. Contact your GP today to book your flu jab. It's quick, safe and free.
www.nhs.uk/flu
NHS



Andrews NJ et al Impact and Effectiveness of 23-valent Pneumococcal Polysaccharied Vaccine Against Invasive Pneumococcal Disease in the Elderly in England and Wales Vaccin 2012 30 (48), 6802-8