Pediatrics TeamWork 437

Childhood Immunization

Done by:

Danah Alkadi Rahaf Althunayan

Revised by:

Aseel Badukhon

Team Leader:

Aseel Badukhon

For remaining notes, please see original slides:
CLICK!
This is due to late time, sorry):

Notes Previous Notes Book Important!

Smallpox

The Last Smallpox Patient on Earth

The case of Ali Maow Maalin, a Somalian cook

ALEXIS C. MADRIGAL DECEMBER 9, 2013

Ali Maow Maalin (World Health Organization)

On December 9, 1979, the Global Commission for the Certification of Smallpox Eradication signed their names to the statement that "smallpox has been eradicated from the world."

History Milestone

- 1000 years ago: Chinese inhaled dried crusts from smallpox pustules
- 1721: “variolation” was introduced from Turkey to Britain by Lady Montagu
- 1796: Edward Jenner: 1st scientific attempt of immunization (cowpox)
- 19th Century: Anthrax 1881, Rabies 1885, Diphtheria antitoxin 1891, Plague 1895, Cholera 1896, Typhoid 1898
- Early 20th Century: BCG 1921, Diphtheria toxoid 1923, Pertusis 1926, Tetanus 1927, Yellow fever 1937, Influenza 1941
- Post World War II: Polio, MMR, Pneumococcal, Meningococcal, HiB, Hepatitis B, Hepatitis A
- 1980: Eradication of Smallpox
- What’s New in the 21st Century??

Edward Jenner

- Edward Anthony Jenner (17 May 1749 – 26 January 1823) was an English scientist who studied his natural surroundings in Berkeley, Gloucestershire. Jenner is widely credited as the pioneer of smallpox vaccine,[1] and is sometimes referred to as the "Father of Immunology"; his works have been said to have "saved more lives than the work of any other man"

James Phipps

Edward Jenner Vaccinating 8 year old James Phipps on 14 May 1796

- James Phipps (1788-1853), as an eight year old boy, and the son of Edward Jenner's gardener, was the first person given the cowpox vaccine by Edward Jenner. Phipps was often used as an living proof that Jenner's vaccine worked.
- Phipps was exposed to the smallpox virus multiple times over the next twenty years, but successfully resisted infection, proving the efficacy of Jenner's vaccination.

Louis Pasteur

Louis Pasteur, 27 December, 1822 – 28 September, 1895

- The great revolution in the vaccination science occurred thanks to the genius French chemist and microbiologist Louis Pasteur who developed an attenuated vaccines to prevent cholera, anthrax and rabies.
- Louis Pasteur was the first person to use the terms Vaccine and attenuated.
- His body lies beneath the Institut Pasteur in France

Joseph Meister

- Joseph Meister (21 February 1876 - 16 June 1940) was the first person to be inoculated against rabies by Louis Pasteur, and the first person to be successfully treated for the infection.
- In 1885, nine-year-old Meister was bitten by a rabid dog after provoking it by poking it with a stick. Pasteur decided to treat the boy with a rabies virus grown in rabbits and weakened by drying, a treatment he had earlier tried on dogs. The treatment was successful and the boy did not develop rabies.

Article from the French newspaper “Le Petit Journal” regarding Joseph Meister’s reported suicide during the German occupation of Paris during World War 1. During the German occupation of Paris, Meister committed suicide by shooting himself with his World War I service revolver rather than allow German soldiers enter Pasteur’s crypt(secret burial place or tomb).

Le Petit Journal

SUPPLÉMENT ILLUSTRÉ

Se suicida Joseph Meister para proteger la cripta de Pasteur

París, 17 junio 1940. Ayer se encontró el cadáver de Joseph Meister, portero del Instituto Pasteur y guardián de su cripta.

Joseph Meister conoció por primera vez a Louis Pasteur en 1885, cuando tenía 9 años de edad.

La madre de Joseph le llevó al hospital del doctor Pasteur porque había sido atacado por un perro rabioso y estaba condenado a una muerte terrible. El doctor que estaba investigando una posible cura, se decidió a probarla en el niño. Tras doce días de tratamiento y hasta diez inyecciones diarias, el niño sanó milagrosamente, dando esperanzas a los demás afectados.

Muchas personas acudieron a los laboratorios de la rué d'Ulm en busca de la cura para la rabia, abarrotando todas las estancias.

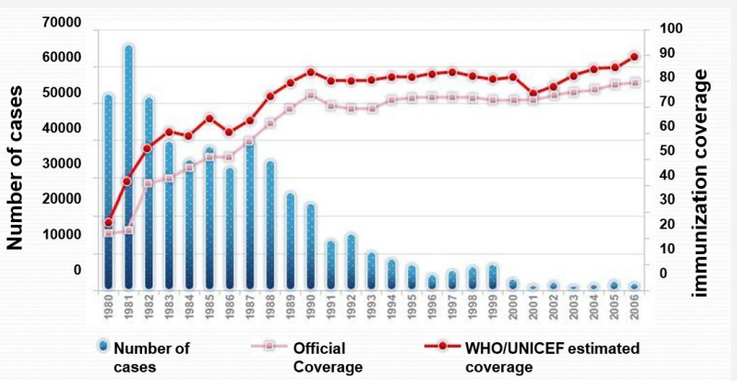
Cerca de 2500 personas afectadas recibieron la milagrosa vacuna en los 15 meses siguientes.

Algunos de los soldados nazis que llegaron con la ocupación a París, decidieron visitar ayer el Instituto Pasteur, pero al pedirle a Joseph Meister que les dejara entrar a la cripta donde descansa el doctor desde 1895, éste prefirió cometer suicido antes que permitirles la entrada a la tumba de su salvador.

POLIOMYELITIS
Global Epidemiology

The global decline in reported poliomyelitis incidence in the 1980s is consistent with the overall increases in immunization coverage

Poliomyelitis global annual reported incidence and third-dose polio vaccine coverage 1980-2006



As vaccination rates increased, polio cases decreased.

WHO estimates for 2007: 1278 reported cases worldwide

[1] WHO. Vaccine preventable diseases monitoring system Global Summary 2007. WHO. Immunization Vaccines and Biologicals. Global and regional summary. Accessed Feb 2008. Available from: http://whqlibdoc.who.int/hq/2007/WHO_IVB_2007_eng.pdf

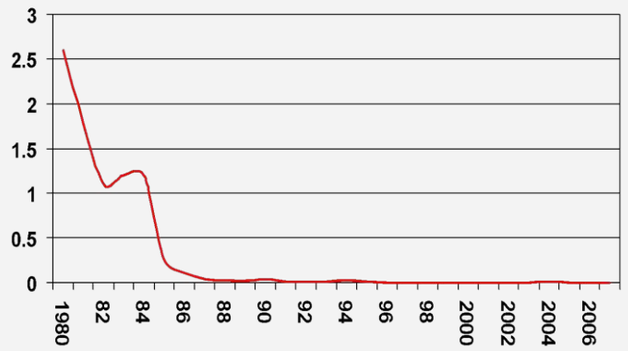
[2] WHO Global Polio Eradication Initiative Wild poliovirus weekly update. Accessed February 2008. Available from: http://www.polioeradication.org/casecount.asp

[3] WHO. Global Polio Eradication Initiative Strategic Plan 2004-2008. 2003

Important to note that it was not only infants and children involved in the outbreak, but adults and older age groups too.

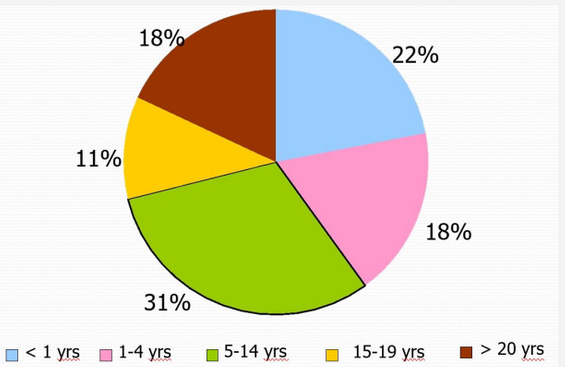
Polio Incidence

KSA 1980 – 2007

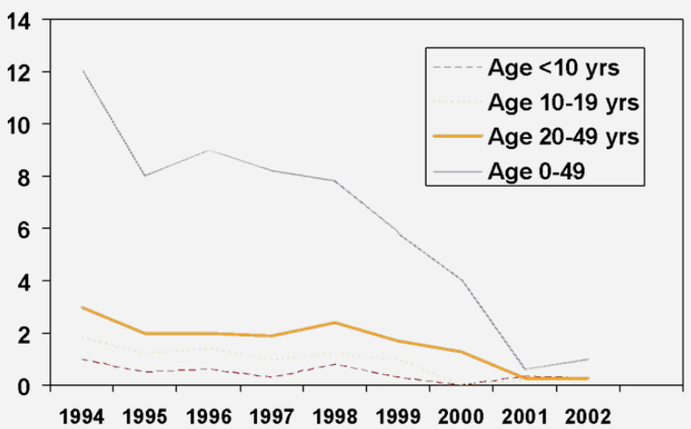


Measles Outbreak

KSA, January - February 2007
736 Cases by Age



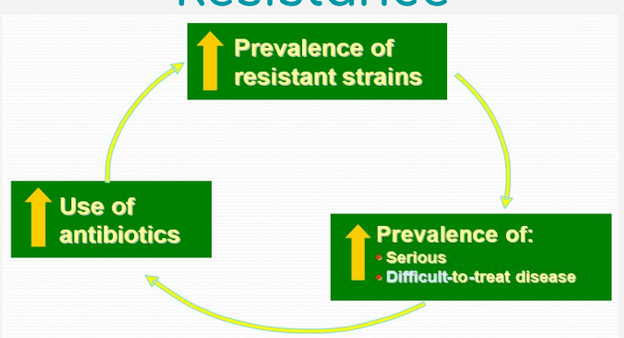
Varicella-related hospitalization rates among persons aged <50 years, by year and age group United States, 1994-2002



Summary of the studies on anti-HAV IgG prevalence in Saudi Arabia (1986-2006)

Percent anti-HAV (IgG)	Age Group (years)	No. of Subjects	Area (Region)	Year	Reference No.
76.5	1-15	1015	Western	1986	Ramia et.al
79	6-18	5876	Eastern	1987	Fathalla et.al
92	1-10	2582	All Regions	1989	El-Hazmi
52.4	1-10	4375	All Regions	1989	Al-Rashed
50.5	1-12	4575	All Regions	1989	Al-Faleh et.al.
24.7	1-12	243	Central (Riyadh)	1995	Arif M et.al.
30.2	1-15	592	Central (Riyadh)	1996	Khalil et.al.
24.9	1-12	5355	All Regions	1997	Al-Faleh
28.9	All (mostly children)	2399	Central (Riyadh)	2005	Al Muneef

Cycle of Antibiotic Resistance



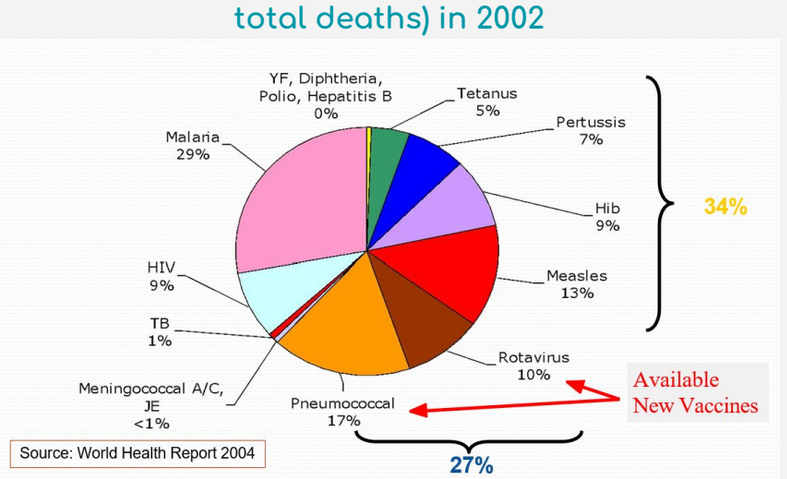
Meningitis in Saudi Children under 5 Years of Age

Etiology	# of Cases (%)	Incidence/100,000
H. influenzae type B	58 (28)	17
N. meningitides	37 (18)	11
S. pneumoniae	23 (11)	7
Other bacteria	23 (11)	7
Aseptic	67 (32)	19
Total	208 (100)	61

Y Al Mazrou et. al. J trop pediatr 2004; 50(3): 131-6

Vaccines are not only helpful by preventing disease but also help break the cycle on antibiotic resistance.

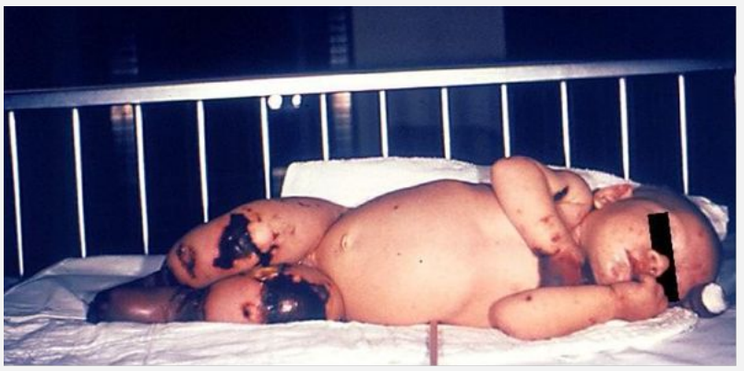
Causes of 4.1 million deaths in under-five (out of 10.5 million total deaths) in 2002



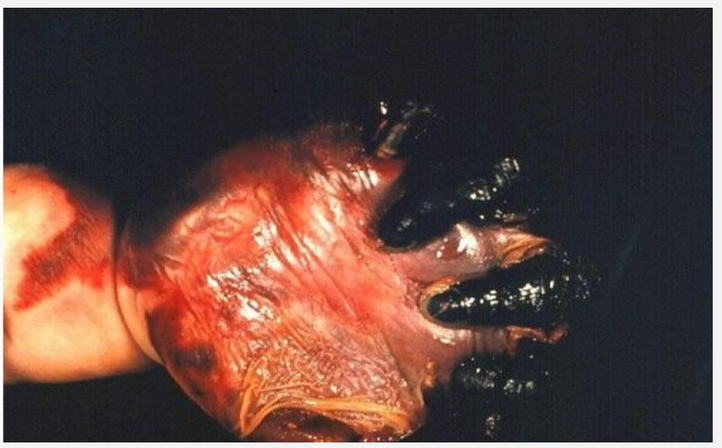
Now the top 3 causes on meningitis are covered by vaccines and incidence rates have therefore dropped significantly.

We now have vaccines for all these infections except malaria and HIV.

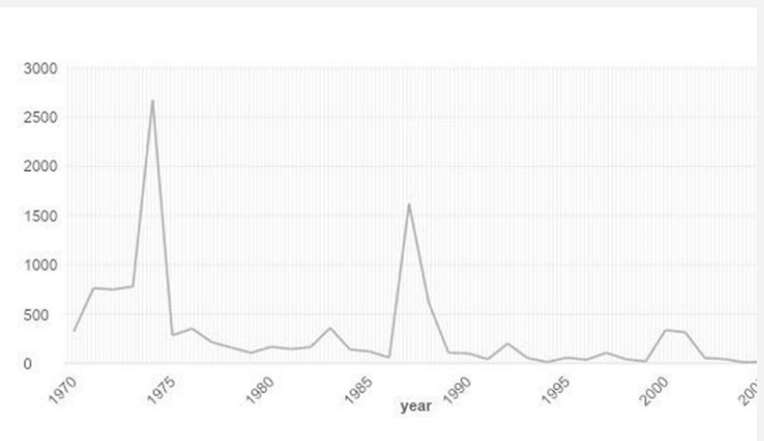
Four-month-old female with gangrene of hands and lower extremities due to meningococcemia



Four-month-old female with gangrene of hands and lower extremities due to meningococcemia

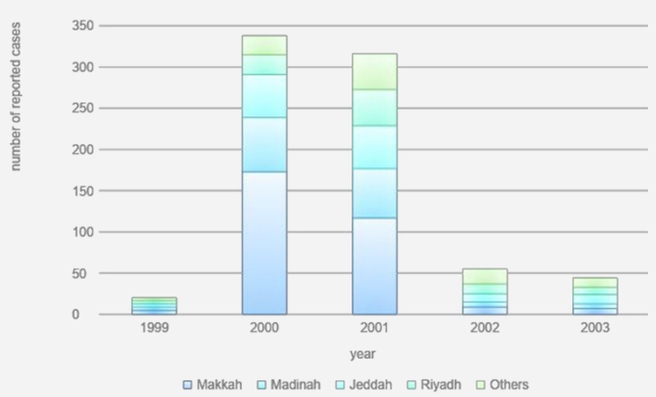


Reported Cases of Meningococcal Disease Saudi Arabia, 1970 – 2008

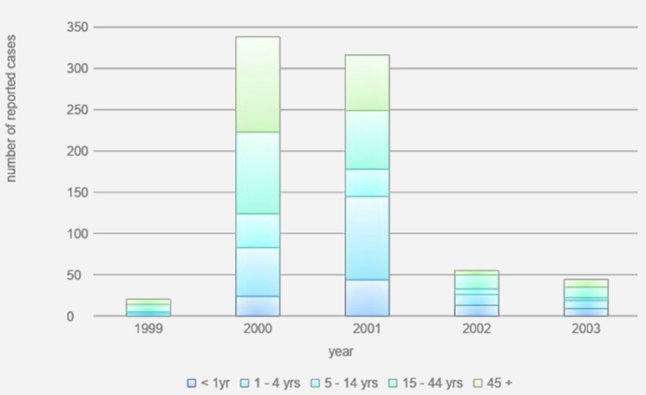


Source: Kingdom of Saudi Arabia, Ministry of Health, February 2009

Meningococcal Cases by Region, Saudi Arabia, 1999 - 2003

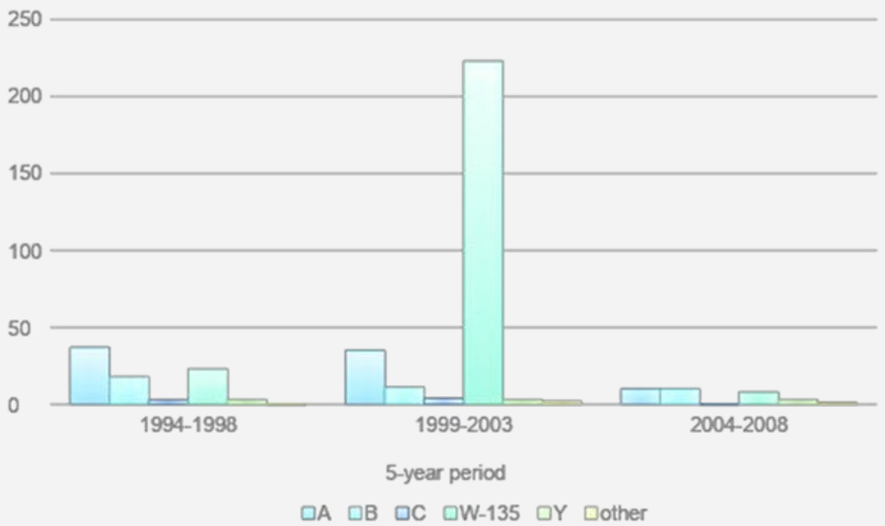


Meningococcal Cases by Age Group, Saudi Arabia, 1999 - 2003



Meningococcal Disease by Serogroup* Saudi Arabia, 1994 – 2008

*** Cases for whom a serogroup was identified and reported**



In KSA the most common meningococcal serogroups are A, C, W-135 and Y. All of which are covered by the meningococcal vaccine.

Serogroup B is not common here, more common in europe and western regions.

Source: Kingdom of Saudi Arabia, Ministry of Health, February 2009

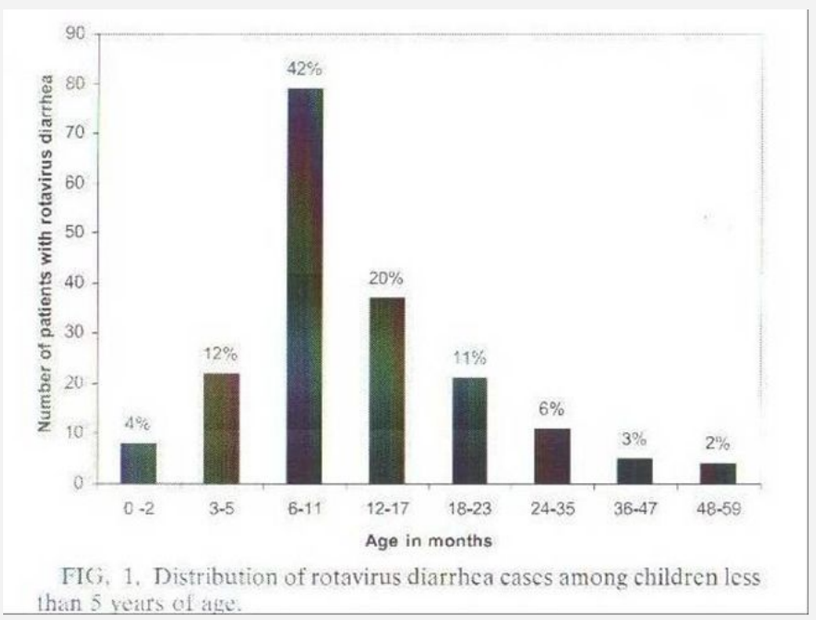
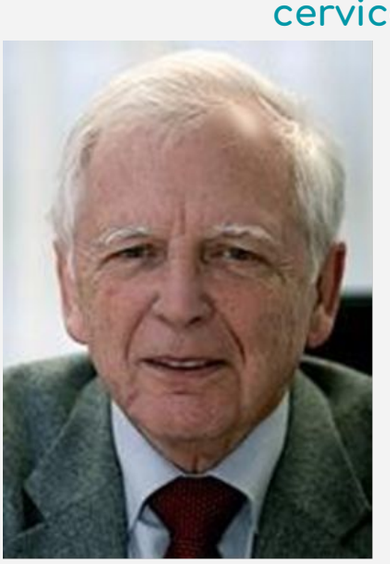


FIG. 1. Distribution of rotavirus diarrhea cases among children less than 5 years of age.

The Nobel Prize in Physiology for Medicine 2008 Harald Zur Haussen "for his discovery of human papilloma viruses causing cervical cancer"



HPV Vaccination

- Getting vaccinated against HPV infection is your best protection from cervical cancer!
- 3 Vaccines have been licensed by the FDA

Vaccine Name	Protects Against
Gardasil	HPV types 6, 11, 16, 18
Gardasil 9	HPV types 6, 11, 16, 18, 32, 33, 45, 52, 58
Cervarix	HPV types 16 and 18

Both HPV Vaccine and screening PAP smears have proven important in the prevention of cervical cancer.

HPV types 16 and 18 are most important causes of cervical cancer

- HPV vaccination works extremely well. It has the potential to prevent more than 90% of HPV-attributed cancers. With more than 15 years of data we know that HPV vaccines offer long lasting protection against HPV infection and disease.

Immunity & Immunization

Immunization

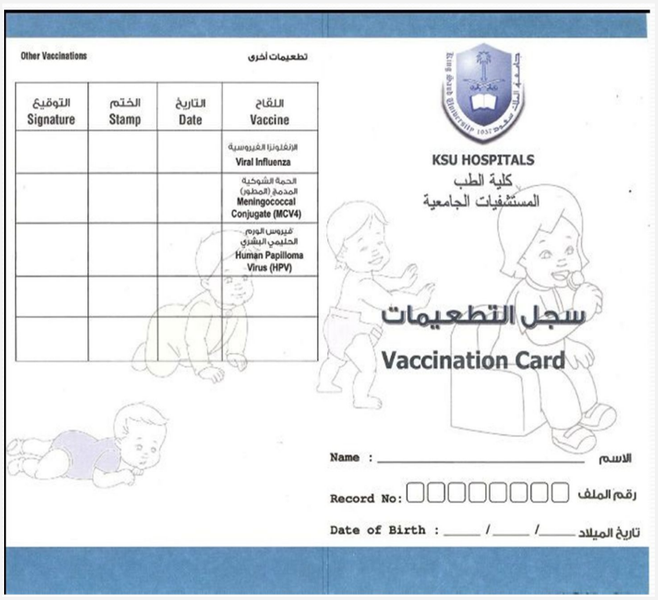
Types:

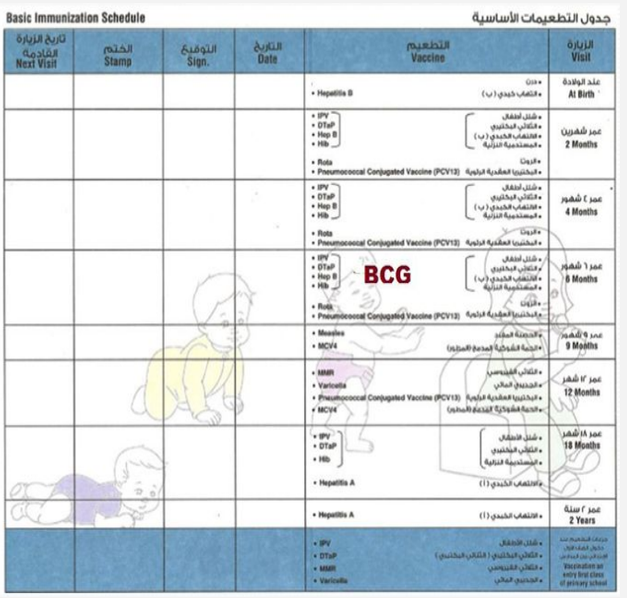
- Active
  - Immunity generated by the patient's immune system so it takes longer but provides lifelong immunity
  - We introduced the whole organism or the killed (attenuated) form of it or any product of the organism i.e. tetanus toxoid
  - Could cause side effects as it elicits an immune response (eg.fever)
  - Immunizing antigens
    - Ie. what is the ingredient in the vaccine (eg. live or attenuated, inactivated or killed, toxoid, whole cell vaccine, surface antigen)
    - IMPORTANT:
      - Live or Attenuated vaccines mean the same thing
      - Inactivated or Killed vaccines mean the same thing
  - Site, route and dose
    - Best site is the anterolateral thigh due to its bulkiness and the lateral side doesn't contain any important or large arteries and veins, later on we can use the upper outer quadrant of the buttock.
    - Hep B vaccine does not produce antibodies if injected into the arm for some reason so we prefer anterolateral thigh
    - Route of administration is determined by the manufacturer eg. oral, subcutaneous (slow absorption), intramuscular (fast absorption)
    - Dose depends on each vaccine
  - Scheduling
    - Have to know before ordering the vaccines, Is it one dose or does it require multiple booster doses.
  - Simultaneous administration of vaccines
    - No problem with it, can combine as many vaccines as possible.
    - If you give one live and one killed dont give them on the same site as the live material may interfere with the killed material
- Passive
  - Immunity generated by pre-antibodies injected within the vaccine
  - Therefore it can be used in emergencies but it has a short life = 3 months approx!
  - Minimal side effects
  - Includes IgG antibodies transferred from mother to baby via the placenta.

Immunity & Immunization

Immunization

It's important for you to know the saudi immunization schedule





Notes on Saudi Immunization Schedule

Recent Changes:

- Timing of BCG vaccine moved to 6 months (used to be given at birth))
- BCG is given in the 6th month of life because by then we will know if the patient has any form of immunodeficiency (eg. SCID) as the BCG vaccine is live attenuated.
- If these patients are given BCG they could develop disseminated TB (fatal)

Other notes to help you remember:

2, 4, and 6 Months:

- Vaccines at 2, 4, and 6 months are almost the same (except for single BCG dose at 6 months)
- We used to use Oral polio vaccine but now we use inactivated polio vaccine (IPV). Because as with the BCG vaccine, the love oral polio vaccine could cause "vaccine associated paralysis (VAP)"
- DTaP: Diphtheria, Tetanus and acellular Pertussis (acellular pertussis vaccine given over whole cell vaccine as its immunogenic but less reactogenic)
- HBV vaccine uses surface antigen
- Hib (Haemophilus influenzae type B) used to be number 1 cause of meningitis
- Rotavirus vaccine given orally
- Pneumococcal conjugate vaccine (PCV13) covers 13 serotypes

9 Months:

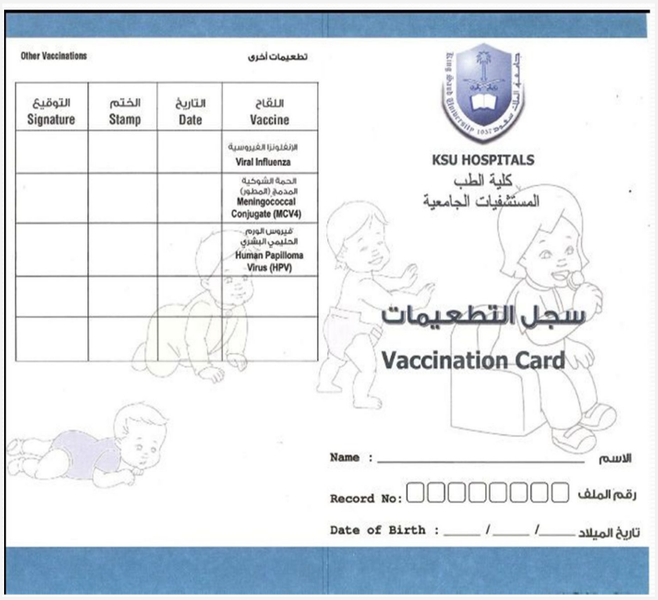
- Measles
- MCV-4 (Meningococcal Conjugate Vaccine 4) effective against serogroups A, C, W-135 and Y

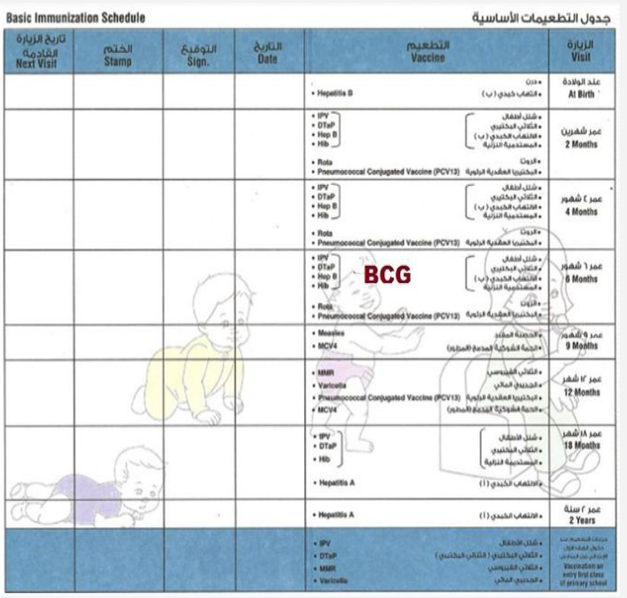
12 Months:

- MMR (Measles, Mumps, Rubella)
- Varicella (Chicken pox)
- PCV13 booster
- MCV-4 booster

Immunity & Immunization

Immunization





Notes on Saudi Immunization Schedule Cont.

18 Months:
- Known as “first booster” “المنشطة الأولا” (IPV, DTaP, HiB)
- Plus Hepatitis A

2 Years:
- Hepatitis A

4-6 Years:
- Almost like 18 months
- IPV, DTaP, MMR, Varicella

<u>Additional Vaccinations:</u>

Viral Influenza:
- Should be given to all children especially those with comorbidities (eg. Down syndrome, immunocompromised, Diabetics)
- Can give from 6 months +

HPV:
- Important especially in girls

COVID-19:
- Currently vaccinating ages 6 months to 5 years
- Particularly important as there are quite a few complications of COVID-19 in children. The worst of which is an entity known as “Multiple inflammatory Syndrome (MIS-C)”
- MIS-C presents after 7-10 days of COVID-19 infection with severe diarrhea and rash. These cases must be given immunoglobulins and admitted to the NICU

Types of COVID-19 Vaccines

- Active Immunity (Vaccination)
  - DNA vaccine (Inovio)
  - **RNA vaccine (Moderna and Pfizer)**
  - viral vector (Oxford AstraZeneca, CanSino Biologics, Janssen (J&J) Gamalaya-Spuntnik)
  - Viral subunit (Novavax, AdaptVac, Clover Biopharma)
  - Live attenuated (Codagenix, Indian Immunoloficals Ltd.)
  - inactivated virus (SinoVac, SinoPram)
  - VPL (Viral Like Particles)
  - split virus vaccines (e.g. Flu Vaccines)
  - RNP (Ribonucleoproteins) Vaccine.
- Passive immunity (antibody administration)
  - Antibodies
    - monoclonal antibodies (e.g. Bamlanivimab)
    - polyclonal antibodies (e.g. Regeneron)
  - Convalescent plasma
  - mRNA induced antibody (M.I.T)

Immunization in special clinical circumstances:

- Preterm
- Pregnancy
- Immunodeficient
- Asplenic children
- History and family seizures
- Children with chronic diseases
- Foreign travel

Misconceptions concerning vaccine contraindications

- Mild acute illness with low-grade fever or mild diarrhea illness in an otherwise well child.
- Current antimicrobial therapy or the convalescent phase of illness.
- Recent infection to an infectious disease
- Breast feeding
- A history of non-specific allergies or relatives with allergies
- Reaction to a previous DTP dose that involved only soreness, redness, or swelling in the immediate vicinity of the vaccination site or temperature less than 105F (40.5 C).
- Prematurity
- Pregnancy of mother or other household contact.
- Family history of Sudden Infant Death Syndrome in children considered for DTP vaccination.
- Family history of an adverse event, unrelated to immunosuppression, after vaccination.
- Malnutrition

Immunity & Immunization

- Lapsed immunizations and unknown immunization status.
- Reimmunization
- Interference with immunoglobulin
- Vaccine safety and contraindications
- Immunization after exposure to disease.

Questions

Q. Is it possible to immunize a child with neurological disorder?
Q. Is it possible to immunized a child during a minor illness?
Q. My child is having eczema and evidence of atopy. Can he be immunized?
Q. Is it possible to administer multiple vaccines simultaneously?
Q. Does the lapse in the immunization schedule require re-institution of the entire series?
Q. If a child immunization status is unknown – what to do?
Q. Is it possible to give vaccines during immunosuppressive therapy?
Q. Is it possible to immunize a child who recently received immune globulins?
Q. When to immunize a child born prematurely?
Q. My child is allergic to egg, can he be immunized?

Why vaccine hesitancy?

- Wakefield
- Anti-Vaccine Group
- Social Media In KSA

Questions Parents Have About Vaccines

- Now that illnesses have disappeared do we really need all of these vaccines?
- Can some vaccines be delayed until my child is older or spread out over time?
- Since so many other children are immunized, do mine need vaccines?
- Vaccines contain preservatives and other additives, are they harmful?
- There are so many vaccines, do they overwhelm the immune system or case long term harm?

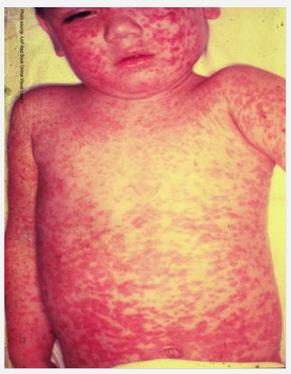
Questions From Healthcare Workers

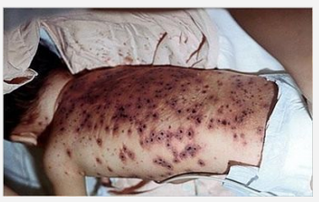
- Influenza vaccine is not effective, so why should I take it?
- I have never had influenza infection in my life and so why should I still take the vaccine?

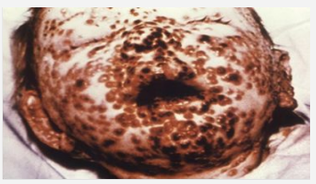
- If immunization history not known start from month 2 vaccinations at any age along with required vaccinations for current age (you can give them 5 days apart so you don't give the child multiple injections at once)
If immunization history known but the patient stopped at a certain vaccine, continue from last received vaccine There is no age to decide not to vaccinate an unvaccinated child

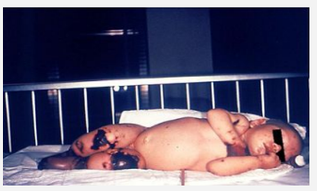
may be required in outbreaks
IMP: No interference with killed vaccines, but in live or attenuated vaccines they interfere through immunoglobulins given for tx with vaccine products, so try to have enough time between giving them (either vaccinate 2 weeks prior to Ig infusion), but in some cases, like kawasaki disease you must wait 6 months after administering Ig before vaccinating the child as the patient requires a huge amount of Ig
(severe combined immunodeficiency)
After exposure: administer vaccine within 48-72 hours for it to work otherwise give Ig -passive immunity-

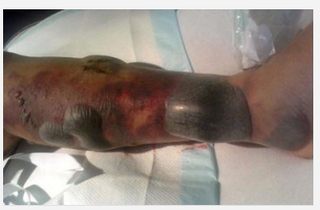
Figures of Infections

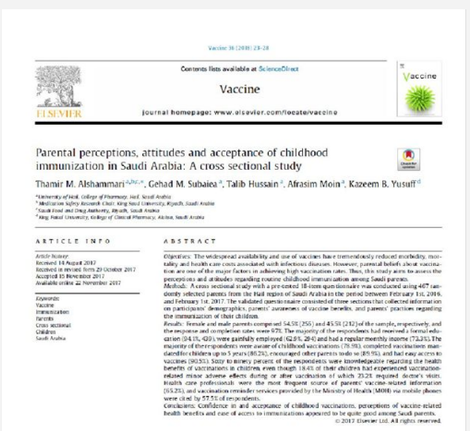










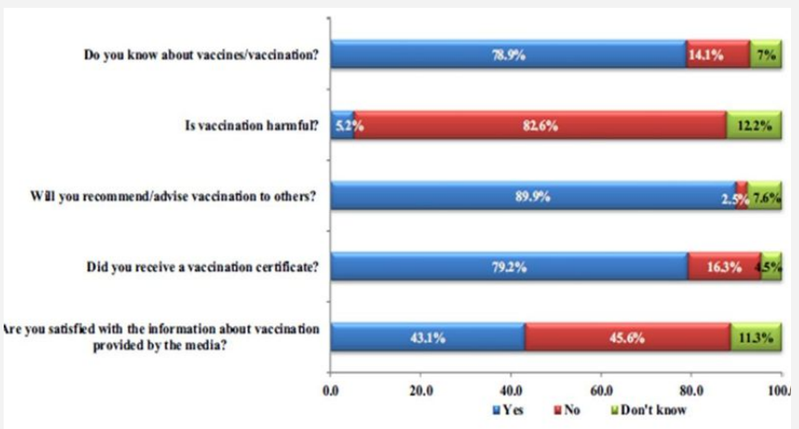


Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Parental perceptions, attitudes and acceptance of childhood immunization in Saudi Arabia: A cross sectional study

Thamir M. Alshammari, Gehad M. Subaiea, Talib Hussain, Afrasim Moin, Kazeem B. Yusuff

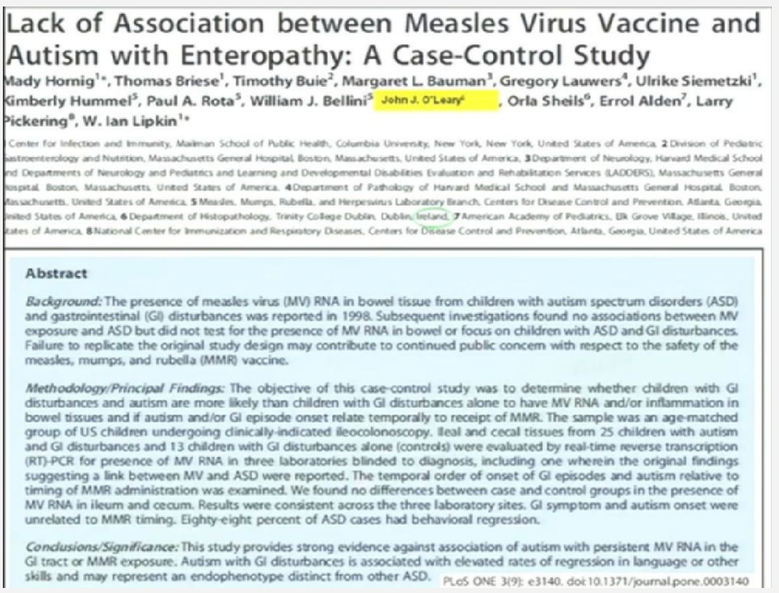


10 Great Public Health Achievements - Industrialized Countries

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from coronary heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco as a health hazard

MMR and Autism

Strong Evidence against an association of Autism with MMR Vaccine



Lack of Association between Measles Virus Vaccine and Autism with Enteropathy: A Case-Control Study

Mady Hornig[1]*, Thomas Briese[1], Timothy Buie[2], Margaret L. Bauman[3], Gregory Lauwers[4], Ulrike Siemetzki[1], Kimberly Hummel[5], Paul A. Rota[5], William J. Bellini[5] John J. O'Leary[6], Orla Sheils[6], Errol Alden[7], Larry Pickering[8], W. Ian Lipkin[1]*

1 Center for Infection and Immunity, Mailman School of Public Health, Columbia University, New York, New York, United States of America, 2 Division of Pediatric Gastroenterology and Nutrition, Massachusetts General Hospital, Boston, Massachusetts, United States of America, 3 Department of Neurology, Harvard Medical School and Departments of Neurology and Pediatrics and Learning and Developmental Disabilities Evaluation and Rehabilitation Services (LADDERS), Massachusetts General Hospital, Boston, Massachusetts, United States of America, 4 Department of Pathology of Harvard Medical School and Massachusetts General Hospital, Boston, Massachusetts, United States of America, 5 Measles, Mumps, Rubella, and Herpesvirus Laboratory Branch, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America, 6 Department of Histopathology, Trinity College Dublin, Dublin, Ireland, 7 American Academy of Pediatrics, Elk Grove Village, Illinois, United States of America, 8 National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America

Abstract

Background: The presence of measles virus (MV) RNA in bowel tissue from children with autism spectrum disorders (ASD) and gastrointestinal (GI) disturbances was reported in 1998. Subsequent investigations found no associations between MV exposure and ASD but did not test for the presence of MV RNA in bowel or focus on children with ASD and GI disturbances. Failure to replicate the original study design may contribute to continued public concern with respect to the safety of the measles, mumps, and rubella (MMR) vaccine.

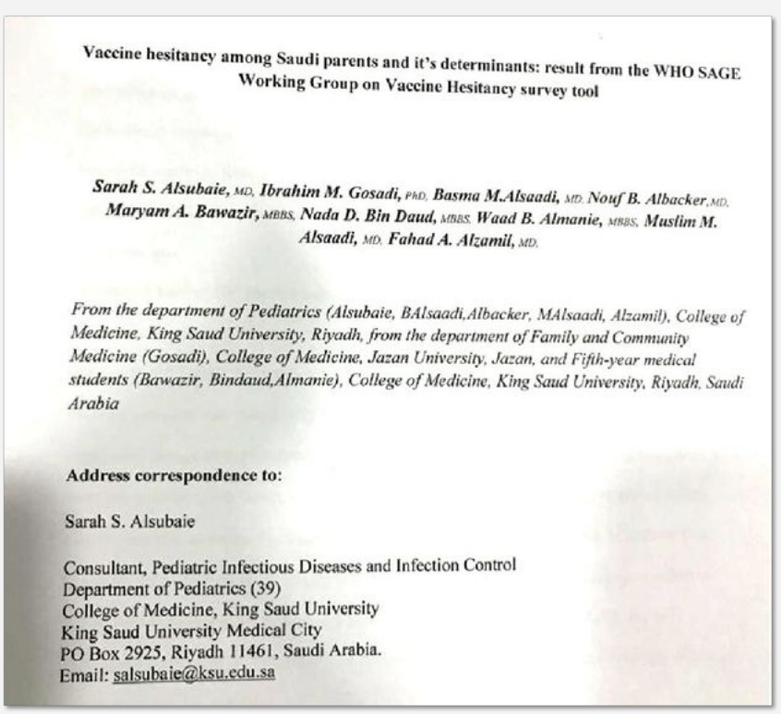
Methodology/Principal Findings: The objective of this case-control study was to determine whether children with GI disturbances and autism are more likely than children with GI disturbances alone to have MV RNA and/or inflammation in bowel tissues and if autism and/or GI episode onset relate temporally to receipt of MMR. The sample was an age-matched group of US children undergoing clinically-indicated ileocolonoscopy. Ileal and cecal tissues from 25 children with autism and GI disturbances and 13 children with GI disturbances alone (controls) were evaluated by real-time reverse transcription (RT)-PCR for presence of MV RNA in three laboratories blinded to diagnosis, including one wherein the original findings suggesting a link between MV and ASD were reported. The temporal order of onset of GI episodes and autism relative to timing of MMR administration was examined. We found no differences between case and control groups in the presence of MV RNA in ileum and cecum. Results were consistent across the three laboratory sites. GI symptom and autism onset were unrelated to MMR timing. Eighty-eight percent of ASD cases had behavioral regression.

Conclusions/Significance: This study provides strong evidence against association of autism with persistent MV RNA in the GI tract or MMR exposure. Autism with GI disturbances is associated with elevated rates of regression in language or other skills and may represent an endophenotype distinct from other ASD.

PLoS ONE 3(9): e3140. doi:10.1371/journal.pone.0003140

Autism Rates Following Removal of Thimerosal from Vaccines

Location	Year Removed	Result	Journal
Denmark	1992	Incidence of Autism increased	Pediatrics 112:604 2003
Canada	1996	Prevalence of Autism increased	Pediatrics 118:139 2006
USA	2001	Prevalence of Autism Increased	Arch Gen Psychiat 65:19 2008



Vaccine hesitancy among Saudi parents and it's determinants: result from the WHO SAGE Working Group on Vaccine Hesitancy survey tool

Sarah S. Alsubaie, MD, Ibrahim M. Gosadi, PhD, Basma M.Alsaadi, MD, Nouf B. Albacker, MD, Maryam A. Bawazir, MBBS, Nada D. Bin Daud, MBBS, Waad B. Almanie, MBBS, Muslim M. Alsaadi, MD, Fahad A. Alzamil, MD,

From the department of Pediatrics (Alsubaie, BAlsaadi,Albacker, MAlsaadi, Alzamil), College of Medicine, King Saud University, Riyadh, from the department of Family and Community Medicine (Gosadi), College of Medicine, Jazan University, Jazan, and Fifth-year medical students (Bawazir, Bindaud,Almanie), College of Medicine, King Saud University, Riyadh, Saudi Arabia

Address correspondence to:

Sarah S. Alsubaie

Consultant, Pediatric Infectious Diseases and Infection Control
Department of Pediatrics (39)
College of Medicine, King Saud University
King Saud University Medical City
PO Box 2925, Riyadh 11461, Saudi Arabia.
Email: salsubaie@ksu.edu.sa

Hesitancy and Refusal According to Type of Vaccines

Vaccine	Hesitant		Refused	
	Frequency	Proportion	Frequency	Proportion
Chickenpox	10	2	2	0.4
Hemophilus influenza B	13	2.6	5	1
Hepatitis B	7	1.4	6	1.2
Human papilloma virus	8	1.6	3	0.6
Influenza	58	11.6	43	8.6
Polio	14	2.8	10	2
MMR	47	9.4	7	1.4
Meningococcal	10	2	2	0.4
Pentavelent/hexalent	7	1.4	2	0.4
Pneumococcal	10	2	4	1.4
Rotavirus	11	2.2	4	0.8
Tetanus, diphtheria, pertusis	23	4.6	10	2
All vaccines	14	2.8	3	0.6

Main Worries & Concerns Reported by 100 Vaccine Hesitant Parents

Concern/worry	%
Concerns related to vaccine safety	53
Vaccine may cause:	
Autism (MMR)	26
Seizure (DTaP)	14
Paralysis (oral polio vaccine)	7
Attention-deficit hyperactivity disorder	7
Bronchial asthma	4
Diabetes (influenza)	4
Infertility (human papillomavirus)	2
Fear of side effects (allergy, fever, local pain)	41
Mistrust in vaccine effectiveness	26
Low perception of disease severity (influenza)	17
Negative information on vaccination	9
Vaccine may affect child's immunity	8
Previous reaction to a vaccine	3

Conclusion

- Vaccines are safe and effective
- Vaccines are tested thoroughly prior to license
- Unvaccinated children at risk
- Commitment to vaccination

Respond to Parents

- Vaccine hesitancy among parents in Saudi is a concern.
- Countering concern related to vaccine must be tailored, particularly in higher-educated groups.

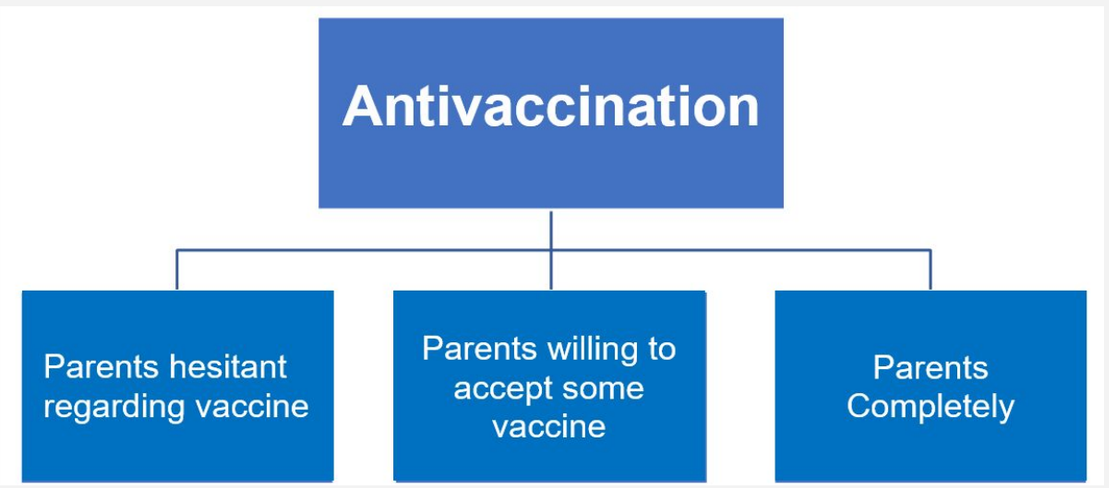
Vaccine Hesitancy and Health Promotion

Communication

Speech or writing should be simple, direct, clear, brief, sincere, unambiguous and targeted

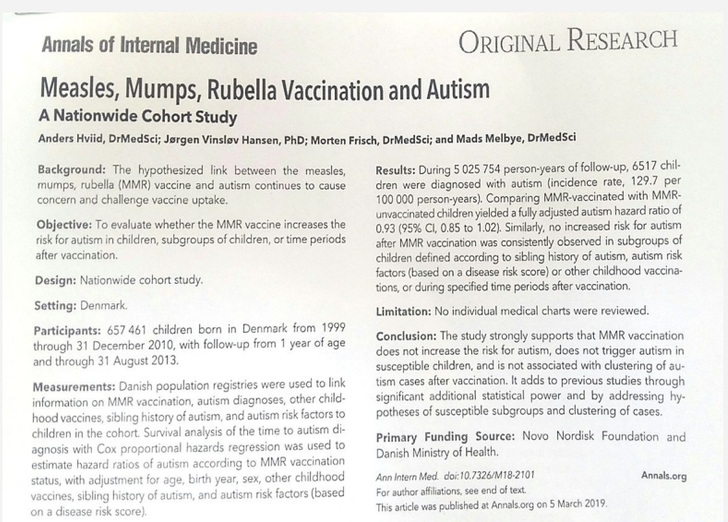
Clear Language

A thorough review of the research involving people and animals provides no evidence that the measles-mumps-rubella (MMR) vaccine causes autism. However, because the cause of autism are unknown, resear on autism needs to continue.



Concerns	**Safety of Vaccines**	**Safety of Vaccines**	**Safety of Vaccines**

Information → **Friends, Relatives Internet, Traditional media, Celebrities** → **Anti-vaccine websites**



Annals of Internal Medicine ORIGINAL RESEARCH

Measles, Mumps, Rubella Vaccination and Autism

A Nationwide Cohort Study

Anders Hviid, DrMedSci; Jørgen Vinsløv Hansen, PhD; Morten Frisch, DrMedSci; and Mads Melbye, DrMedSci

Background: The hypothesized link between the measles, mumps, rubella (MMR) vaccine and autism continues to cause concern and challenge vaccine uptake.

Objective: To evaluate whether the MMR vaccine increases the risk for autism in children, subgroups of children, or time periods after vaccination.

Design: Nationwide cohort study.

Setting: Denmark.

Participants: 657 461 children born in Denmark from 1999 through 31 December 2010, with follow-up from 1 year of age and through 31 August 2013.

Measurements: Danish population registries were used to link information on MMR vaccination, autism diagnoses, other childhood vaccines, sibling history of autism, and autism risk factors to children in the cohort. Survival analysis of the time to autism diagnosis with Cox proportional hazards regression was used to estimate hazard ratios of autism according to MMR vaccination status, with adjustment for age, birth year, sex, other childhood vaccines, sibling history of autism, and autism risk factors (based on a disease risk score).

Results: During 5 025 754 person-years of follow-up, 6517 children were diagnosed with autism (incidence rate, 129.7 per 100 000 person-years). Comparing MMR-vaccinated with MMR-unvaccinated children yielded a fully adjusted autism hazard ratio of 0.93 (95% CI, 0.85 to 1.02). Similarly, no increased risk for autism after MMR vaccination was consistently observed in subgroups of children defined according to sibling history of autism, autism risk factors (based on a disease risk score) or other childhood vaccinations, or during specified time periods after vaccination.

Limitation: No individual medical charts were reviewed.

Conclusion: The study strongly supports that MMR vaccination does not increase the risk for autism, does not trigger autism in susceptible children, and is not associated with clustering of autism cases after vaccination. It adds to previous studies through significant additional statistical power and by addressing hypotheses of susceptible subgroups and clustering of cases.

Primary Funding Source: Novo Nordisk Foundation and Danish Ministry of Health.

Ann Intern Med. doi:10.7326/M18-2101 Annals.org

For author affiliations, see end of text.

This article was published at Annals.org on 5 March 2019.

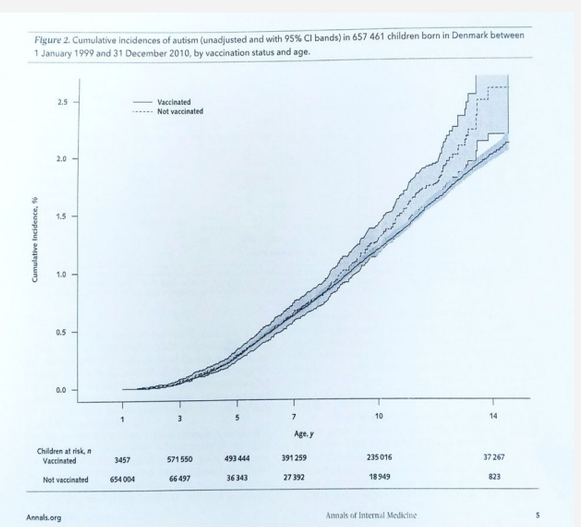
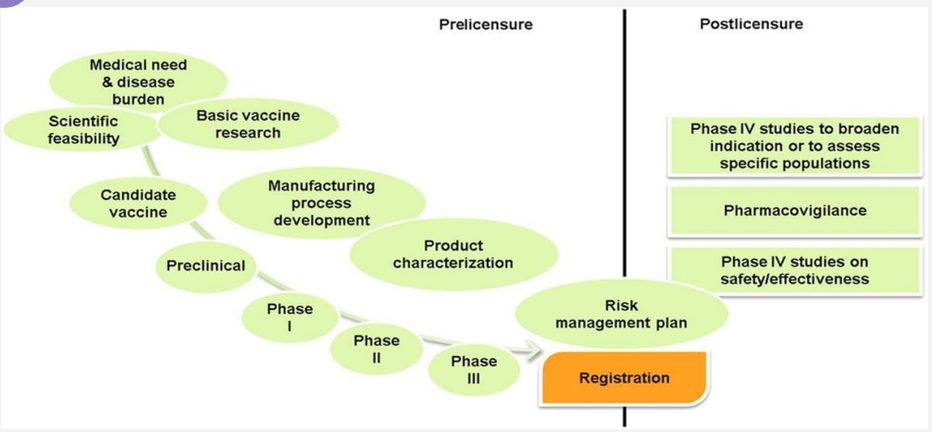


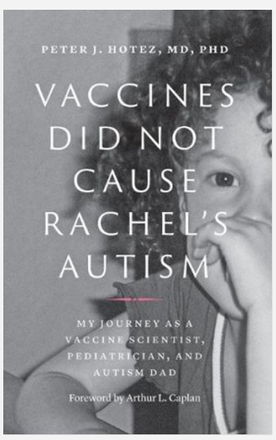
Figure 2. Cumulative incidences of autism (unadjusted and with 95% CI bands) in 657 461 children born in Denmark between 1 January 1999 and 31 December 2010, by vaccination status and age.

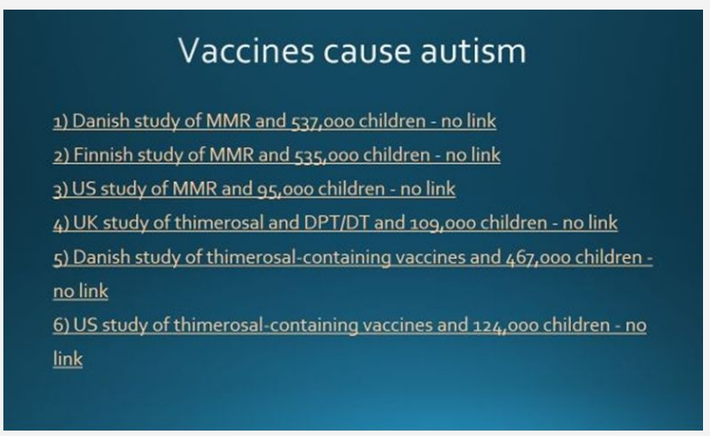
Testing of Vaccines



Vaccines Mythbusting

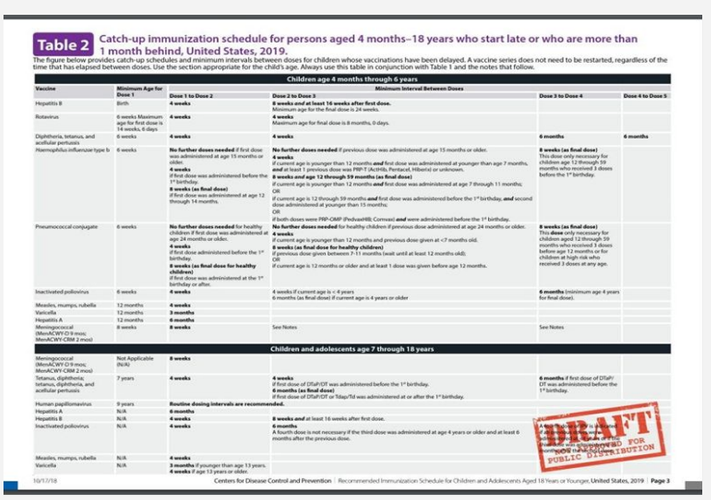
1. If you want to pump your kid full of massive amounts of toxins . .
2. toxins like mercury
3. and aluminum . . .
4. and polysorbate 80 . . .
5. aborted foetal tissue . . .





Breaking News

- BGC vaccine delayed to six months
- HPV on the way for Saudi citizen
- Irradication of polio virus type 3
- Dengue virus vaccine is available



Further Reading

- http://www.vaccineinformation.org
- Red Book 2009 (28th Edition) Report of the Committee on Infectious diseases
- Immunization – Childhood and Travel Health 3rd Edition
- **13 questions from Ped cases:** https://pedscases.com/node/1018/take?quizkey=b17c959de0d7c1b6899bfc6888b44778

Book!

Contraindications

Vaccination should be postponed if the child has an acute illness; however, a minor infection without fever or systemic features is not a contraindication. Following vaccination, there may be swelling and discomfort at the injection site and a mild fever and malaise. Some vaccines, such as MMR vaccine, may be followed by fever or malaise 7 days to 10 days later. Live vaccines should not be given to children who are immunocompromised, on or in contact with a child on immunosuppressive therapy (except in children with HIV infection on ART in whom MMR vaccine can be given), and advice should be obtained if the mother was on immunosuppressive therapy during pregnancy. A child who has had an anaphylactic reaction to a vaccine should not be given a repeat dose. Rare adverse reactions, which may not be identified during clinical trials, need to be reported. For example, an association between a rotavirus vaccine and an increased risk of intussusception, which had not been identified on clinical trials, led to its replacement with safer vaccines. Local guidelines about vaccination and its contraindications should be followed.

Give it a look!

Disease/Vaccine	Risks Associated with Disease	Risks Associated with Vaccine
Measles (MMR vaccine, which protects against measles, mumps and rubella)	– Pneumonia (1 in 20) – Ear infection leading to permanent deafness (1 in 10) – Seizure – Brain damage due to swelling/ inflammation of the brain (1 in 1,000) – Death (1-2 in 1,000) – Measles during pregnancy can result in miscarriage, low-birth-weight, or premature birth.	– Fever (up 1 in 6) – Mild rash (~ 1 in 20) – Swelling of glands in the cheeks or neck (rare) – Seizure caused by fever (1 in 3,000) – Temporary pain and stiffness in the joints – Temporary low platelet count (1 in 30,000) – Serious allergic reaction (1 in 1,000,000)
Pertussis (DTaP vaccine, which protects against diphtheria, tetanus and pertussis)	– Coughing spells that interfere with breathing, eating, and drinking – Pneumonia (1 in 4) – Seizure – Apnea (two thirds) – Convulsions (1 or 2 in 100) – Brain damage due to swelling/ inflammation of the brain (1 in 300) – Death (1 or 2 in 100)	– Redness or swelling where the shot was given (up to ~ 1 in 4) – Fever (up to ~ 1 in 4) – Soreness or tenderness where the shot was given (up to ~ 1 in 4) – Fussiness (up to ~ 1 in 3) – Tiredness or poor appetite (up to ~1 in 10) – Vomiting (up to ~ 1 in 50) – Seizure (1 in 14,000) – Crying for 3+ hours (1 in 1,000) – High fever (1 in 16,000) – Serious allergic reaction (~1 in 1 million)

Table 1. Serious Adverse Reactions to Vaccines

Vaccine	*Documented reaction*	*Approximate rate*	*Potential allergen*
Diphtheria and tetanus toxoids and acellular pertussis (DTaP)	Serious allergic reaction[12-14]	1 per 1,000,000 doses[13]	Infanrix syringe contains latex[11]
Measles, mumps, and rubella	Immune thrombocytopenic purpura[14-18]	1 per 20,000 doses[19,20]	Contains neomycin and gelatin[8]
	Serious allergic reaction[14-19,21]	< 1 per 1,000,000 doses[19,22,23]	
Measles, mumps, rubella, and varicella	Febrile seizure[14,15,17-21,24]	8.5 per 10,000 doses[20]	Contains neomycin and gelatin[8]
Meningococcal	Serious allergic reaction[14,25]	Rare[25]	Menomune and Bexsero contain latex[11]
Rotavirus	Intussusception[12,26]	1 per 20,000 to 100,000 doses[26]	Rotarix contains latex in oral applicator of diluents[11]

Information from references 8, and 11 through 26.

MMRV vaccine side effects (Measles, Mumps, Rubella, and Varicella)

What are the risks from MMRV vaccine?

- Sore arm from the injection, redness where the shot is given, fever, and a mild rash can happen after MMRV vaccination.
- Swelling of the glands in the cheeks or neck or temporary pain and stiffness in the joints sometimes occur after MMRV vaccination.
- Seizures, often associated with fever, can happen after MMRV vaccine. The risk of seizures is higher after MMRV than after separate MMR and varicella vaccines when given as the first dose of the two-dose series in younger children. Your health care provider can advise you about the appropriate vaccines for your child.
- More serious reactions happen rarely, including temporary low platelet count, which can cause unusual bleeding or bruising.
- In people with serious immune system problems, this vaccine may cause an infection that may be life-threatening. People with serious immune system problems should not get MMRV vaccine.

If a person develops a rash after MMRV vaccination, it could be related to either the measles or the varicella component of the vaccine. The varicella vaccine virus could be spread to an unprotected person. Anyone who gets a rash should stay away from infants and people with a weakened immune system until the rash goes away. Talk with your health care provider to learn more.

Some people who are vaccinated against chickenpox get shingles (herpes zoster) years later. This is much less common after vaccination than after chickenpox disease.

People sometimes faint after medical procedures, including vaccination. Tell your provider if you feel dizzy or have vision changes or ringing in the ears.

As with any medicine, there is a very remote chance of a vaccine causing a severe allergic reaction, other serious injury, or death.

For more, please visit this link: https://www.cdc.gov/vaccines/vac-gen/side-effects.htm